

# CORNELL UNIVERSITY OFFICIAL PUBLICATION

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Volume XXI

Number 12

Announcement of the Thirty-Ninth

## Summer Session

### 1930

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## ANNOUNCEMENT OF THE SUMMER SESSION

This pamphlet is designed to give prospective students complete information about the Summer Session of Cornell University. On the last page there is a list of other publications which describe the courses of study offered during the regular academic year by the several colleges and schools of the University.

### SUMMER SESSION OF THE LAW SCHOOL

See page 52 for information about the summer courses in Law to be given at Cornell University in 1930.

### THE SUMMER SCHOOL OF BIOLOGY

See page 53 for information about the summer courses in Biology to be given at Cornell University in 1930.

### THE NEW YORK STATE SUMMER SESSION AT CORNELL UNIVERSITY

See page 59 for information about the summer courses in Agriculture and in Home Economics to be given at Cornell University in 1930.

### OFFICE AT GOLDWIN SMITH 252

The office of the Summer Session is in Room 252, Goldwin Smith Hall. This office will be open as a bureau of information on registration day from 9 A. M. till 1 P. M. and from 2 till 5 P. M., and thereafter throughout the session, daily except Saturday from 9 till 12:30 and from 2 till 4.

Members of the staff of instruction may be consulted at their offices on Monday, July 7.

### THE SESSION MUST BEGIN PROMPTLY

In order to get the full number of exercises announced for the session, it is necessary that all work begin promptly on Monday morning, July 7. Students are urged to reach Ithaca in time to be present at the first exercise of each class. They should, if possible, register on Saturday, July 5; if not, then on Monday, July 7, in an hour not occupied by class work.

# THE CALENDAR

## SUMMER SESSION OF 1930

### THE FIRST TEN DAYS

July 5, Saturday, 8 A. M.-5 P. M.	Registration, <i>Room A, Goldwin Smith Hall.</i>
July 7, Monday . . . . .	Instruction begins at the time and place announced for each course. Registration is continued in <i>Goldwin Smith A.</i>
July 8, Tuesday evening . . . . .	Organ Recital, <i>Sage Chapel.</i>
July 10, Thursday evening . . . . .	Piano Recital.
July 11, Friday, until 4 P. M. . . . .	Last day for payment of fees at the Treasurer's office, <i>1 Morrill Hall.</i>
July 13, Sunday, 11 A. M. . . . .	Public Worship and Sermon in <i>Sage Chapel.</i>
July 13, Sunday evening . . . . .	Organ Recital, <i>Bailey Hall.</i>
July 14, Monday evening . . . . .	Lecture Course.

### THE REGULAR WEEKLY SCHEDULE

Sunday, 11 A. M.	Public Worship and Sermon, <i>Sage Chapel.</i>	(Beginning July 13.)
Sunday evening,	Organ Recital, <i>Bailey Hall.</i>	(Beginning July 13.)
Monday evening,	Lecture Course.	(Beginning July 14.)
Tuesday evening,	Organ Recital, <i>Sage Chapel.</i>	(Beginning July 8.)
Wednesday evening,	Departmental Lectures and Conferences.	(Beginning July 9.)
Thursday evening,	Lecture-Recital.	(Beginning July 10.)
Friday evening,	Plays by Summer Theater Company.	(Beginning July 11.)
Saturday evening,	Plays by Summer Theater Company.	(Beginning July 12.)

### CONCERTS

Friday evening: Concert.	<i>Bailey Hall.</i>	Artist to be announced.
Friday evening: Concert.	<i>Bailey Hall</i>	Artist to be announced.

### THE LAST DAY

August 15, Friday . . . . .	Summer Session ends.
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### THE WEEKLY CALENDAR

The WEEKLY CALENDAR of the University carries announcements of all public exercises held in connection with the Summer Session. It is posted on the bulletin boards.

# CORNELL UNIVERSITY

THE SUMMER SESSION OF 1930

## OFFICERS

*The President of the University*

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D.

## ADMINISTRATIVE BOARD

*Executive Committee*

RIVERDA HARDING JORDAN, Ph.D., *Chairman*

BENTON SULLIVAN MONROE, Ph.D., *Secretary*

ROLLINS ADAMS EMERSON, D.Sc., Dean of the Graduate School

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ROBERT MORRIS OGDEN, Ph.D., Dean of the College of Arts and Sciences

ROLLAND MACLAREN STEWART, Ph.D., Director, New York State Summer Session

*The Registrar*

DAVID FLETCHER HOY, M.S.

*The Dean of Women*

R. LOUISE FITCH, A.M.

## STAFF OF INSTRUCTION

(The names of the instructors in the New York State Summer Session at Cornell University are printed on pages 62-64; those of the instructors in the Summer Session of Law, on page 52; those of the instructors in the Summer School of Biology, on page 53.)

RALPH PALMER AGNEW, A.M.	Mathematics
(Instructor in Mathematics)	
ALBERT LEROY ANDREWS, Ph.D.	German
(Assistant Professor of German)	
G. G. ANDREWS, Ph.D.	History
(Assistant Professor of Education, University of Iowa)	
LAWRENCE RUSSELL ANDRUS, A.M.	French
(Instructor in Romance Languages)	
PAUL ROLLAND AUSTIN, B.A.	Chemistry
(Assistant in Chemistry)	
ALFRED WILLIAM AVENS, M.S.	Chemistry
(Assistant in Chemistry)	
DANE LEWIS BALDWIN, A.M.	English
(Instructor in English)	
FREDERIC RICHARD BAMFORTH, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
DOROTHY HAMMOND BATEMAN	Physical Education
(Instructor in Physical Education)	
BURTON CHANDLER BELDEN, A.B.	Chemistry
(Assistant in Chemistry)	
MADISON BENTLEY, Ph.D.	Psychology
(Sage Professor of Psychology)	
MORRIS GILBERT BISHOP, Ph.D.	French
(Assistant Professor of Romance Languages and Literatures)	
SAMUEL LATIMER BOOTHROYD, B.S.	Astronomy
(Professor of Astronomy and Geodesy)	

JULIAN PLEASANT BRETZ, Ph.D.	History
(Professor of American History)	
THOMAS ROLAND BRIGGS, Ph.D.	Chemistry
(Professor of Physical Chemistry and Electro-Chemistry)	
OLIN TEETER BROWN, M.A.	Geology
(Instructor in Geology, Colgate University)	
ARTHUR WESLEY BROWNE, Ph.D.	Chemistry
(Professor of Inorganic and Analytical Chemistry)	
SAMUEL A. BROWNELL, Ph.D.	Education
(Superintendent of Schools, Grosse Point, Michigan)	
JAMES DABNEY BURFOOT, JR., Ph.D.	Geology
(Instructor in Geology)	
LEROY P. BURNHAM, M.S.	Design
(Professor of Architecture)	
EARLE NELSON BURROWS, M.C.E.	Structural Engineering
(Assistant Professor of Structural Engineering)	
HARRY CAPLAN, Ph.D.	Greek
(Assistant Professor of Greek)	
WALTER BUCKINGHAM CARVER, Ph.D.	Mathematics
(Professor of Mathematics)	
CARL G. CHAMBERLAIN	Physical Education
(Director of Physical Education, Charlotte High School, Rochester)	
CLEVELAND KING CHASE, A.M., Litt.D.	Latin
(Professor of Latin, Hamilton College)	
JACOB ROLLAND COLLINS, Ph.D.	Physics
(Assistant Professor of Physics)	
CLYDE FIRMAN CRAIG, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
MAURICE HAYES CROSBY, A.M.	Education
(Assistant Professor of Education, Smith College)	
ROBERT EUGENE CUSHMAN, Ph.D.	Government
(Professor of Government)	
GEORGE IRVING DALE, Ph.D.	Spanish
(Professor of Romance Languages)	
MYRON BONHAM DEILY, Ph.D.	Spanish
(Instructor in Romance Languages)	
ALEXANDER M. DRUMMOND, A.M.	Dramatics
(Professor of Public Speaking)	
CHARLES LOVE DURHAM, Ph.D., Litt.D.	Latin
(Professor of Latin)	
LEAMAN ANDREW DYE, A.M.	Mathematics
(Instructor in Mathematics)	
ELLSWORTH DAVID ELSTON, Ph.D.	Geology
(Professor of Geology, Dartmouth College)	
ALBERT BERNHARDT FAUST, Ph.D.	German
(Professor of German)	
SAMUEL FELDMAN, Ph.D.	Psychology
(Instructor in Psychology)	
ROBERT PAUL FERGUSON, A.B.	Chemistry
(Assistant in Chemistry)	
DONALD LORD FINLAYSON, M.A.	Art
(Assistant Professor of Fine Arts)	
MAX H. FISCH, Ph.D.	Philosophy
(Assistant Professor of Philosophy, Western Reserve University)	
W. D. FORGENG, A.B.	Chemistry
FRANK SAMUEL FREEMAN, Ed.D.	Education
(Assistant Professor of Education)	
SEYMOUR STANTON GARRETT, C.E.	Engineering
(Professor of Mechanics of Engineering)	
ROSWELL CLIFTON GIBBS, Ph.D.	Physics
(Professor of Physics)	

DAVID CLINTON GILLESPIE, Ph.D.	Mathematics
(Professor of Mathematics)	
ADRIAN GORDON GOULD, M.D.	Physical Education
(Assistant Professor of Hygiene and Assistant Medical Adviser)	
GUY EVERETT GRANTHAM, Ph.D.	Physics
(Assistant Professor of Physics)	
GUY SHEPARD GREENE, Ph.D.	English
(Assistant Professor of English, University of Pittsburgh)	
SANTIAGO GUTIERREZ, M.A., LL.B.	Spanish
(Assistant Professor of Romance Languages, Ohio State University)	
EDWIN HAROLD HADLOCK, A.B.	Mathematics
(Instructor in Mathematics)	
MANLEY H. HARPER, Ph.D.	Education
(Professor of Education, Jamaica, N. Y., Training School)	
MARVIN THEODORE HERRICK, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking, University of Illinois)	
HAZEL HICKS, M.A.	Education
(Instructor, State Normal School, Geneseo, New York)	
ALFRED GORDON HOUPt.	Chemistry
(Lecture Assistant in Chemistry)	
HARVEY EARL HOWE, Ph.D.	Physics
(Assistant Professor of Physics)	
MELVIN L. HULSE, M.A.	Education
(Instructor in Education)	
WALLIE ABRAHAM HURWITZ, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN IRWIN HUTCHINSON, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN GAMEWELL JENKINS, Ph.D.	Psychology
(Assistant Professor of Psychology, Iowa State University)	
JOHN RAVEN JOHNSON, Ph.D.	Chemistry
(Assistant Professor of Organic Chemistry)	
RIVERDA HARDING JORDAN, Ph.D.	Education
(Professor of Education)	
EDWIN CRAWFORD KEMBLE, Ph.D.	Physics
(Associate Professor of Physics, Harvard University)	
MARCEL KESSEL, Ph.D.	English
(Instructor in English)	
HENRY CROCKER KETCHAM	Chemistry
(Assistant in Chemistry)	
HORACE KIDGER, A.M., LL.B.	Social Science
(Head of Department of Social Studies, Newton, Mass., High School)	
W. J. KLOPP, Ph.D.	Education
(Director of Teaching, Woodrow Wilson High School, Stony Beach, Calif.)	
MAX LUDWIG WOLFRAM LAISTNER, M.A.	History
(Professor of Ancient History)	
VIVAN STREETER LAWRENCE, JR., B.S., M.E.	Mathematics
(Instructor in Mathematics)	
HOWARD SCOTT LIDDELL, Ph.D.	Physiology
(Assistant Professor of Physiology)	
C. R. LINGLEY, Ph.D.	History
(Professor of History, Dartmouth College)	
LLOYD LINCOLN LOWENSTEIN, A.B.	Mathematics
(Instructor in Mathematics)	
FREDERICK GEORGE MARCHAM, Ph.D.	English History
(Assistant Professor of English History)	
CLYDE WALTER MASON, Ph.D.	Chemistry
(Assistant Professor of Chemical Microscopy)	
JAMES FREDERICK MASON, Ph.D.	French
(Professor of Romance Languages and Literatures)	

ALFRED MARTIN MEYER, A.M.	Education
(Director of Junior High School, Orlando, Florida)	
BENTON SULLIVAN MONROE, Ph.D.	English
(Assistant Professor of English)	
ROYAL EVERT MONTGOMERY, Ph.D.	Economics
(Acting Assistant Professor of Economics)	
CHARLES WALTER MORSE, Ph.D.	Chemistry
(Instructor in Chemistry)	
GUY BROOKS MUCHMORE, A.B.	Public Speaking
(Assistant Professor of Public Speaking)	
D. E. MURRAY, A.B.	Physical Education
(Director of Physical Education, Madison High School, Rochester)	
MAURICE JACKSON MURRAY, A.B.	Chemistry
(Instructor in Analytical Chemistry)	
CHARLES MERRICK NEVIN, Ph.D.	Geology
(Assistant Professor of Geology)	
CLARK SUTHERLAND NORTHUP, Ph.D.	English
(Professor of English and Librarian of the Hart Memorial Library)	
PAUL MARTIN O'LEARY, A.M.	Economics
(Assistant Professor of Economics)	
CHARLES EDWARD O'ROURKE, C.E.	Engineering
(Assistant Professor of Structural Engineering)	
JACOB PAPISH, Ph.D.	Chemistry
(Professor of Chemistry)	
ANDREW PROSPER PELMONT, Ph.D.	French
(Instructor in Romance Languages and Literatures)	
FRANK E. PERCIVAL, B.A., B.M.E.	Music
(Head, Department of Music, State Teachers' College, Stevens Point, Wis.)	
HAROLD CHARLES PERKINS, M.E.	Mechanics
(Assistant Professor of Mechanics of Engineering)	
MILES ALBION POND, Ph.B.	Descriptive Geometry
(Assistant Professor of Civil Engineering)	
LAURENCE PUMPELLY, Ph.D.	French
(Professor of Romance Languages and Literatures)	
JAMES ALBERT RAYNOLDS, B.S.	Chemistry
(Assistant in Chemistry)	
HAROLD LYLE REED, Ph.D.	Economics
(Professor of Economics and Finance)	
ERNEST WILLIAM RETTGER, Ph.D.	Mechanics
(Professor of Mechanics of Engineering)	
NELLIE REUSCHEL	Music
(Instructor in Dalcroze Eurhythmics, New York Institute of Musical Art)	
EDWARD BYRON REUTER, Ph.D.	Sociology
(Professor of Sociology, Iowa State University)	
ASHLEY ROBEY, M.S.	Chemistry
(Assistant in Inorganic Chemistry)	
FRED STILLMAN ROGERS, M.E.	Kinematics
(Professor of Machine Design)	
MARY C. RYAN	Physical Education
(Instructor in Physical Education)	
RUTH NIMMO ST. JOHN, B.S.	Geology
(Instructor in Geology)	
MARTIN WRIGHT SAMPSON, M.A.	English
(Goldwin Smith Professor of English Literature)	
ERNEST WILLIAM SCHODER, Ph.D.	Hydraulics
(World War Memorial Professor of Experimental Hydraulics)	
HERBERT HENRY SCOFIELD, M.E.	Engineering
(Professor of Testing Materials)	
EUGENE WARREN SCOTT, B.S.	Chemistry
(Assistant in Chemistry)	
FRANCIS ROBERT SHARPE, Ph.D.	Mathematics
(Professor of Mathematics)	

## THE SUMMER SESSION

ROBERT PELTON SIBLEY, M.A., L.H.D.	English
(Secretary of the College of Arts and Sciences)	
HAROLD ROBERT SMART, Ph.D.	Philosophy
(Assistant Professor of Philosophy)	
DEAN FRANKLIN SMILEY, M.D.	Hygiene
(Professor of Hygiene and Medical Adviser)	
LLOYD PRESTON SMITH, B.S.	Physics
(Instructor in Physics)	
VIRGIL SNYDER, Ph.D.	Mathematics
(Professor of Mathematics)	
MENO SPANN, Ph.D.	German
(Instructor in German)	
ALFRED SPOUSE	Music
(Supervisor of High School Music, Rochester, N. Y.)	
WALTER HUTCHINSON STANTON, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
WALTER KING STONE	Drawing and Painting
(Assistant Professor of Drawing)	
MARCELLUS H. STOW, M.A.	Geology
(Assistant Professor of Geology, Washington and Lee University)	
WILLIAM STRUNK, JR., Ph.D.	English
(Professor of English)	
RALPH COLTON TALLMAN, A.B.	Chemistry
(Assistant in Chemistry)	
CHARLES KENNETH THOMAS, A.B.	Public Speaking
(Instructor in Public Speaking)	
CLARENCE ELLSWORTH TOWNSEND, M.E.	Mechanical Drawing
(Professor of Drawing in the College of Engineering)	
LEONARD CHURCH URQUHART, C.E.	Structural Engineering
(Professor of Structural Engineering)	
CHARLES G. VARDELL, JR., B.A., A.A.G.O.	Music
(Dean of the School of Music, Salem College, N. C.)	
RUSSELL HALDERMAN WAGNER, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
KENNETH LELAND WASHBURN, B.F.A.	Drawing and Painting
(Instructor in Free-hand Drawing)	
PAUL JOHN WEAVER, B.A.	Music
(Professor of Music)	
HARRY PORTER WELD, Ph.D.	Psychology
(Professor of Psychology)	
HERBERT AUGUST WICHELSNS, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
ALBAN G. WIDGERY, M.A.	Philosophy
(Acting Professor of Philosophy)	
WEBB YORK, M.D.	Hygiene
(Assistant Professor of Hygiene and Assistant Medical Adviser)	
CHARLES VAN PATTEN YOUNG, A.B.	Physical Education
(Professor of Physical Education and Director of the Gymnasium)	
KARL ABELL ZELLER, Ph.B., A.M.	Physics
(Teacher of Science, High School, Columbus, Ohio)	



## OBJECT OF THE SESSION

### INSTRUCTION ADAPTED TO VARIOUS NEEDS

The primary object of the Summer Session is to advance education by helping those engaged in it. The instruction is adapted to the needs of the following classes:

1. Professors and teachers in colleges and schools, superintendents, and supervisors of special branches of instruction.

The announcements of the different departments show a wide range of work. This work is either advanced and, therefore, suited to specialists who wish to pursue their individual study; or more elementary and adapted to teachers who desire to start in a new field. In addition to the instruction of the classroom, the University's libraries, museums, laboratories, and shops are open for use.

2. College students in Cornell or other universities who wish to make some scholastic use of the long vacation, especially those whose college studies may for one reason or another have been interrupted. Graduates may count some of the courses toward an advanced degree. See the Announcement of the Graduate School with regard to opportunities for advanced work and research during the summer.

Undergraduates who are in good standing academically may anticipate requirements and thereby shorten their course, or may make up existing deficiencies. The conditions for receiving credit, and the amount which may be obtained, are stated below, under the head of Academic Credit for Work.

3. Students entering the University and wishing to obtain surplus credit at entrance, or to complete the entrance requirements.

It often happens that students have in June more or less than the requirements for admission to college. The Summer Session affords them the opportunity either to add to their surplus and thus, in some cases, to gain a year in time; or to make up their deficiency.

4. All persons qualified to pursue with profit any course given, whether or not they are engaged in formal study or teaching.

### ACADEMIC CREDIT FOR WORK

#### IN THE COLLEGE OF ARTS AND SCIENCES

The academic requirements for the degree of Bachelor of Arts are the completion of one hundred and twenty hours of elective work. Before graduation a student must complete six hours in each of certain specified groups of study, thirty of these hours during the first two years, under certain restrictions (the underclass requirements). During his last two years he must also elect twenty hours in some one department or group of related departments (the upperclass requirements).

To obtain credit toward the Cornell degree by means of work done in Summer Sessions, a student must have previously satisfied the entrance requirements of the College, and must obtain in advance

the Dean's approval of his selection of courses. He may then obtain in any Summer Session credit for the number of hours he passes, with a minimum of four or a maximum of eight in each Session. Credit for thirty hours, but no more, may be secured in this way.

The Summer Session records of students registered in the College of Arts and Sciences are reviewed by the usual standing committees of the College, and poor records in the Summer Session are liable to the same penalties as in the regular University session.

The foregoing regulations apply to students matriculated at Cornell. Undergraduates enrolled in other institutions and wishing to have credits earned in the Summer Session applied on their work at such other institutions should, before coming to Ithaca, consult their own college authorities and make all arrangements by them deemed necessary. The Cornell Summer Session can assume no responsibility for the use to be made of credits earned by students thus coming from other places of study. The certificates mentioned on page 12 will show what courses have been taken, the amount of credit in terms of Cornell "hours," and the grades.

#### IN OTHER COLLEGES OF THE UNIVERSITY

The nature and amount of credit allowed in other colleges at Cornell for work in the Summer Session may be learned from the statements under the announcement of each course.

#### IN THE GRADUATE SCHOOL

A graduate of any college whose requirements for a first degree are substantially equivalent to those for the first degree at Cornell may be admitted to resident study in the Graduate School. He may at once enter upon candidacy for an advanced degree if he is able to show that he has had adequate preliminary training in the subjects in which he proposes to work. The requirements for the degree do not depend primarily on the completion of any prescribed number of courses or of a fixed term of residence. They are rather based upon actual achievement in scholarship and research in the fields indicated by the major and minor subjects. The writing of a thesis and the passing of a special examination are also required; except that for the degrees of Master of Arts in Education and Master of Science in Education the thesis may be waived in consideration of certain other requirements. The minimum period of residence for the Master's degree is one academic year or its equivalent and for the Doctor's degree three years.

Not all work done by a graduate student is graduate work in the strict sense of the term. Graduate work to be considered acceptable for a degree must be of advanced character in some field or department of knowledge. No residence towards a master's degree will be granted any student who does not register with the Dean of the Graduate School within three days after the opening of the Session,

and who does not formally become a candidate for this degree under the direction of a special committee; see below. The latest day for such registration in 1930 is July 10.

Students of the University Summer Session, of the Summer School of Biology, and of the New York State Summer Session who have been admitted to candidacy for an advanced degree are required to pay the regular tuition fee of the session, sixty dollars, but are exempt from tuition and administration fees in the Graduate School. On registering for the first time as candidates, students who have not previously matriculated in Cornell University will pay the regular matriculation fee of ten dollars. See the full statement of fees in the Graduate School on page 14.

The residence requirements for the Master's degree may be fulfilled in whole or in part by attendance during the Summer Session of the University. For this purpose, two Summer Sessions will be regarded as the equivalent of one term, and four Summer Sessions as the equivalent of one year. Candidates for this degree who are in residence during Summer Sessions only are also required to continue their studies during the year under the direction of the chairman of the special committee in charge of their work.

Any person wishing to become a candidate for an advanced degree and to study during the Summer Session is advised to write to the professor whose work he expects to take, and also to the Dean of the Graduate School, asking for a blank form of application for admission to the Graduate School. It is much better to make these arrangements before coming to Ithaca, thus avoiding delay and interruption of study after the Summer Session has begun. In this way, moreover, it may be possible to secure the advice and guidance of professors in fields of study of which no specific mention is made in the announcements. Not all departments formally offer graduate work. In some departments, notably in the Summer School of Biology, opportunities for research may be had for a longer period than the six weeks during which courses are formally conducted.

Each student, upon entering the Graduate School, must choose a field of study. Within that field, the branch of knowledge to which he intends to devote the larger part of his time is termed his major subject; the other subject or subjects, which will necessarily be more restricted in their scope and which should be selected with reference to their bearing on the major subject, are termed the minor subjects.

The degree of Master of Arts in Education and of Master of Science in Education is offered to candidates regularly qualified to enter the Graduate School. These degrees are designed for school executive officers and teachers who do not wish to enter upon the more restricted program of study involving intensive research, or who wish to supplement previous training in order to meet advanced professional requirements for certification. Suggested programs of study for such candidates have been prepared, subject to modification to suit individual needs. Complete information regarding such pro-

grams may be obtained by addressing the Chairman of the Division of Education, Sage College, Ithaca, N. Y.

The work of each graduate student who is a candidate for an advanced degree is in charge of a special committee consisting of the teachers under whom his major and minor studies are pursued, a representative of his major subject being chairman. The student is expected to confer freely with the members of his special committee, both in regard to the general plan of his work and in connection with individual courses of study. A student upon registering in the Summer Session with the intention of doing graduate work as a candidate for an advanced degree must also register with the Dean of the Graduate School and present to him a statement of his major and minor subjects approved by the members of his special committee.

In certain departments an invitation is issued to scholars who are beyond the stage of regular graduate study to make use of the resources of the University in these fields for carrying on research,

### CERTIFICATES FOR WORK DONE

Students of the Summer Session who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for them must be made before August 10, and the applicant must leave at the office of the Registrar a large-sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail. The regulations of each department for the granting of a certificate must be met.

## GENERAL INFORMATION

### CONDUCT AND SCHOLARSHIP

The Summer Session is conducted under the same general regulations concerning conduct and scholarship as apply during the academic year. For this reason students are requested to familiarize themselves with dormitory and other rules, and to abide by them. The officers of the University also reserve the right to cancel the registration of any student at any time for neglect of scholastic duties. The rules governing student conduct are:

"A student is expected to show both within and without the University unfailing respect for order, morality, personal honor, and the rights of others. The authority to administer this rule and to impose penalties for its violation is vested in the University Committee on Student Affairs. The rule is construed as applicable at all times, in all places, to all students of the University. A student may at any time be removed from the University if, in the opinion of the Committee on Student Affairs, his presence is not conducive to the University's best interests."

### ADMISSION

There are no examinations for admission to the Summer Session. Each person must, however, satisfy the instructor in charge of every course he intends to take, unless it be elementary, that he is qualified to pursue the work.

An undergraduate student who is registered in a college at Cornell or elsewhere and who wishes to enter the Summer Session must secure from his dean or other competent authority a certificate of good standing. Students on probation are regarded as not in good standing. A blank form of certificate may be had on application to the Secretary of the Summer Session.

Undergraduate students whose names have been removed from the rolls of any college at Cornell University are not admitted to the Summer Session except upon the recommendation of the college concerned. Students whose names have been removed from the rolls of any college not at Cornell are not admitted to the Summer Session under any circumstances.

There are some special requirements to be met by applicants for admission to the summer session of the Law School, and such persons should consult the separate announcement of that session.

Admission to the classrooms during the Summer Session is restricted to students duly registered for the session. A student thus duly registered may occasionally visit any class; but if he wishes to attend regularly without credit he must secure special permission from the Chairman of the Summer Session. Such permission will be granted only when the student can show a serious purpose in such attendance.

If a student entering the Summer Session wishes his work to count toward a degree, there are certain regulations that he must comply with, and he will find them set forth under the head of Academic Credit for Work, page 9.

## REGISTRATION

All students of the Summer Session are required to register with the Registrar of the University. The hours and places of registration are given in the Calendar of the session, on page 3. Students may register on Saturday, July 5, between 8 A. M. and 5 P. M., or on the day of their arrival, if they reach Ithaca on July 7, or later. They are urged to register on July 5. Registration before that day is not required, and it is not necessary to apply in advance for registration blanks.

Beginning on Monday, July 7, the Registrar's office in Morrill Hall will be open from 9 A. M. till 4 P. M. every week day except Saturday, when it will be closed at noon.

Students who wish to obtain credit for graduate work to be done during the Summer Session must register not only with the Registrar but also with the Dean of the Graduate School, at his office in Room 22, Morrill Hall.

Persons who are to take courses in the New York State Summer Session and in any department of the Summer Session of the University must register for both the Summer Session and the New York State Summer Session. They are required to pay only one tuition fee.

## TUITION

The charge for tuition in the Summer Session of the University is sixty dollars. In the summer session of the Law School it is one hundred dollars for the whole session of eleven weeks, or fifty dollars for either term of five and one-half weeks.

The tuition fee is payable in full, on the first registration day or within the next five days, at the office of the Treasurer, Morrill Hall.

Students in the Graduate School are required to pay fees as follows:

An administration fee of \$12.50 for each term of the academic year.

A tuition fee of \$75.00 for the academic year (\$37.50 each term).

If taking work in any of the summer courses all students must register both in the Graduate School and such summer course or courses, and pay a tuition fee equal to that of the University Summer Session.

No student shall receive the master's degree who has not paid tuition equivalent at least to one academic year, during the academic year, or summer courses, or both; and no one shall receive the doctor's degree who has not paid tuition for the equivalent of at least three academic years, unless one or more of the years spent in study for the doctor's degree shall have been spent in approved graduate study at another university—but in any event at least the equivalent of one academic year's tuition must be paid while in graduate study at the University.

Any student of the Graduate School who has completed the requirements of residence for the degree for which he is a candidate, whose studies have been satisfactory to the Faculty as evidenced by

a certificate to that effect signed by the Dean of the Graduate School, and who during that time has satisfied the requirements as to tuition fees, is, on paying the regular administration fees of each subsequent term or summer course exempt from the further payment of tuition fees for a period not to exceed one academic year, or the equivalent four summer courses.

To those entitled to exemption from summer course tuition fees, an administration fee of \$6.25 for each summer's work is charged.

If registered during the summer under Personal Direction students are required to register with the Registrar as well as in the Graduate School and to pay an administration fee of \$10.00.

If registered under Personal Direction, a student in the Graduate School who is not exempt from summer course tuition fees, may be permitted, upon joint approval of the Professor directing his work and the Chairman or Director of any of the summer courses, to take one or more subjects in any of such courses upon the payment of such part of the regular tuition fees (pro rata or otherwise) as may be determined by the administrative board of the particular summer course.

On registering for the first time as a candidate, a student who has not previously matriculated in Cornell University, must pay a matriculation fee of \$10.00 in addition to any other fees. This fee is not refundable.

Any student who fails to pay his tuition charges, other fees, and other indebtedness to the University, or who, if entitled to free tuition, fails to claim it at the Treasurer's office and to pay his fees and other indebtedness, within the prescribed period of grace, is thereby dropped from the University unless the Treasurer has granted him an extension of time to complete payment. The Treasurer is permitted to grant such an extension when, in his judgment, the circumstances of a particular case warrant his doing so. For any such extension the student is assessed a fee of \$5 for the first week and \$2 additional for each subsequent week in which the whole or any part of the debt remains unpaid, but the assessment in any case is not more than \$15. The assessment may be waived in any instance for reasons satisfactory to the Comptroller and the Registrar, when such reasons are set forth in a written statement.

If a student withdraws from the Summer Session, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal be stated in writing and be satisfactory to the Comptroller and the Registrar. In such a case the student is required to pay twenty-five per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal.

Students registering at any time during the last four weeks of the Summer Session or of either term of the summer session of the Law School are required to pay for the remainder of the term at the rate of twenty-five per cent of the term's tuition for each week or fraction of a week between the date of registration and the last examination day of the term.

Any tuition fee or other fee may be changed by the Trustees to take effect at any time without previous notice.

#### IN THE NEW YORK STATE SUMMER SESSION

Tuition in any of the undergraduate courses of the Summer School of Agriculture and of the Summer School of Home Economics is free

to admitted students who are residents of the State of New York and who have been residents for at least one year immediately preceding registration. *An incidental fee of ten dollars* is, however, charged to all students for admission. Students from outside the State of New York, whether they take one subject or more, are required to pay sixty dollars, in which is included the incidental fee.

Free tuition does not include instruction in the Summer School of Biology or any instruction outside the College of Agriculture and the College of Home Economics, nor are students receiving free tuition permitted to attend classes outside the College of Agriculture and the College of Home Economics.

Graduate students who register in the Summer Session as candidates for advanced degrees are required to pay the regular tuition fee of sixty dollars. If they have not previously matriculated in Cornell University, they must also pay a matriculation fee of ten dollars. See page 60.

### OTHER FEES

In *Chemistry* a laboratory fee is charged for material actually consumed. A deposit of such amount as the instructor may prescribe must be made with the Treasurer.

*Physics.* For laboratory fees in physics see descriptions of courses.

In *Geography and Geology*, in Course S 8 and in Course S 9 a fee of one dollar must be paid in advance to the Treasurer to cover incidental expenses of the course.

In *Drawing and Painting*, Course S 7, a fee of ten dollars is required.

In *Public Speaking*, Course S 45, a special laboratory fee of five dollars is required.

In *Music*, Course S 3, Delcroze Eurhythmics, a special fee of ten dollars is required.

*Biology.* A laboratory fee is charged for each course in Biology, the fee varying with the character of the course. The amount which the student must expect to pay upon beginning any course is stated in the description of that course, under the head of Summer School of Biology, page 53.

*Swimming.* A special charge of ten dollars is made for the instruction in Swimming.

*Tennis.* A special charge of ten dollars is made for instruction in Tennis.

*Shop-Work.* Students not matriculated in the College of Engineering of Cornell University are required to pay a fee of \$3.50 for each credit hour of shop-work for which they register.

*Library.* A person who obtains the privilege of taking books from the University Library for home use is required to make a deposit of five dollars, which will be refunded upon the return of all books taken out.

*Willard Straight Hall.* A fee of three dollars is charged for the privileges of Willard Straight Hall. See page 20.



RESIDENTIAL HALLS: ROOMS: BOARD  
FOR WOMEN

The University has three groups of residential halls for women in which board and room can be obtained during the Summer Session by registered students only. They are:

*Sage College*, which accommodates 175 persons. Here the charge for room, table board, and a specified amount of laundry, for the session, is from \$81 to \$96 according to the size and location of the room.

*Prudence Risley Hall*, which accommodates 184 persons. Here the charge for room, board, and a specified amount of laundry, for the session, is from \$87 to \$96, according to the size and location of the room.

*The Balch Halls* (four units), which accommodate 318 persons. Here the charge for board, room, and a specified amount of laundry, for the session, is \$101.

Besides these halls, there are certain *approved houses* which are occupied exclusively by women and which, like the halls, are under the direct supervision of the Dean of Women.

Undergraduate women students of Cornell and other colleges and other women students under twenty-one years of age are expected to live in the residential halls or the approved houses. Any woman student should consult the Dean of Women before engaging a room.

In the residential halls for women the charge for room and board includes lodging Friday night, July 4 (not earlier), breakfast Saturday, July 5, and all meals to and including breakfast Saturday, August 16.

Members of the Summer Session who lodge outside Sage College, Prudence Risley Hall, and the Balch Halls may obtain table board at any of those halls for \$10 a week.

Each of the residential halls is in charge of a warden, who is glad to know the students, to advise them in illness or other emergency, and to give them whatever information they wish about the University or the town. It is understood that persons living in the halls will conform to the house regulations made for the convenience and comfort of all.

*Application for rooms in any of the residential halls or approved houses for women should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y.* Information about such rooms may be obtained from the Manager in advance of the application. The list of approved houses will be available after June 1 on application to the Manager, and also, if desired, a supplementary list of private houses with desirable rooms available for mature women who prefer to live outside any of the halls or approved houses. Checks should be drawn to the order of Cornell University.

*A deposit of five dollars* must accompany each application for a room in any of the residential halls; otherwise the application will not be

entertained. The rooms are reserved in the order of application. If a room assigned is occupied by the applicant, the amount of the deposit is held until the end of the session to cover the return of keys and any damage to building or furniture other than ordinary wear and tear, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager on or before June 15 that she wishes to withdraw her application.

### FOR MEN

Men regularly enrolled in the Summer Session can obtain comfortable rooms either in the New Residential Halls for Men, which are thoroughly modern and of fireproof construction, or in Cascadilla Hall, which is an older building with modern fixtures and furnishings.

In the *New Residential Halls* the charge for furnished room, including care of the room and laundry of bed linen, is \$21 for the session. There are a few suites at a higher rate, and some rooms on the top floor may be had for less.

In *Cascadilla Hall* the charge for furnished room, including care of the room and laundry of bed linen, is from \$15 to \$30 for the session, according to the size and location of the room.

Board can be obtained for an average of \$1 to \$1.50 a day in Willard Straight Hall or in other dining rooms or restaurants on or near the campus.

*Applications for rooms in the New Residential Halls for Men or in Cascadilla Hall, or for plans of the rooms or other information about them, should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y.* Checks should be drawn to the order of Cornell University.

A list of private houses offering desirable rooms for rent for the session can be obtained after June 1 by application to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y.

### THE COST OF LIVING

An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given above. In a private house a student may be able to rent a room at a little less cost for the session than in one of the residential halls. Rooms are rented with the understanding that they will be occupied for the entire session unless both parties agree otherwise. Table board is generally engaged by the week.

### MEANS OF SELF-SUPPORT

Students, either men or women, who wish to earn a part of their expenses during the session are invited to correspond in advance with the Manager of Residential Halls, Morrill Hall, Ithaca.

## THE STUDENT'S HEALTH

## MEDICAL ADVICE

The University's staff includes medical advisers of men and of women, with a corps of assistants. The medical advisers observe regular office hours, from 9 A. M. till 1 P. M. daily, at the medical offices in the Old Armory. A trained nurse is on duty from 2 P. M. till 4 P. M. daily. No charge is made for these services.

In cases of illness or indisposition which involve absence from classes even for one day, students are expected to report immediately either in person, by telephone, or by messenger to the medical adviser's office. For the convenience of the adviser such illness should be reported early in the day. Students indisposed but still able to attend classes should consult the medical adviser immediately in order that advice may be given and that diagnosis of incipient diseases may be made promptly. Any student failing to report as soon as possible to the medical adviser any contagious or infectious disease will be regarded as guilty of a serious breach of discipline.

A medical examination is not required of students in the Summer Session.

A student may at any time be requested to withdraw from the University if, in the opinion of the University authorities, the condition of his health is such as to make it unwise for him to remain.

Every student matriculating in Cornell University must present a certificate showing that he has been vaccinated within five years. Students in the Summer Session are not matriculated students and of them accordingly such vaccination certificate is not required. If, however, students attending the Summer Session should matriculate in any of the colleges of the University or in the Graduate School, they must give evidence of recent vaccination like others so matriculated.

## THE UNIVERSITY INFIRMARY

The University Infirmary occupies three large buildings near the campus. The first of these, a brownstone structure, was the home of Henry Williams Sage, for many years chairman of the Board of Trustees of the University. After his death in 1897, his sons, Dean and William Henry Sage, endowed it and gave it to the University for a student's infirmary as a memorial to their father. The second building, the Schuyler House, was purchased in 1911; in 1912 the Trustees erected a third building, fireproof, and this is the present main hospital building. The normal capacity of the Infirmary is seventy-five beds; the number can be doubled in an emergency.

The Infirmary, which is in charge of an experienced superintendent and is thoroughly equipped, provides suitable rooms, food, and nursing for sick students. It has no medical staff; students find their own physicians among practitioners in Ithaca or elsewhere.

Students in the Summer Session have all the privileges of admission to the Infirmary. They pay no fee in advance, but are liable to regular charges for services rendered.

## THE LIBRARIES

The University Library is open on week days from 8 A. M. till 10:30 P. M. In this building are the main library, containing about 500,000 volumes, and most of the seminary and special libraries. The main reading room affords accommodations for more than two hundred readers, and contains a selected library of about 8,000 volumes of reference works. Below stairs is the periodical room in which are kept the current numbers of about 500 journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, to a limited extent, allowed to take out books for home use. Persons wishing this privilege must make a deposit of \$5, which will be refunded upon the return of all books taken out.

The reference library in Goldwin Smith Hall is open for the use of summer students from 9 A. M. till 5 P. M on week days except Saturday, when it is closed at noon.

The library of the Law School numbers more than 56,000 volumes and about 5,800 pamphlets, to which generous additions are made yearly. It includes the library of the late Nathaniel C. Moak of Albany, N. Y., which was presented in 1893 by Mrs. A. M. Boardman and Mrs. Ellen D. Williams, as a memorial to Judge Douglas Boardman, the first dean of the School. In reports of the federal courts, and of the several American state jurisdictions, and in English, Scotch, Irish, Canadian, Australian, and English colonial reports, the law library is practically complete to date.

The Library of the College of Agriculture, in the basement of Stone Hall, is open on week days from 9 A. M. till 5 P. M., except Saturday, when it is closed at 1 P. M. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, in the department of entomology on the fourth floor of Roberts Hall, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

## WILLARD STRAIGHT HALL

All privileges of Willard Straight Hall, the social center of the University, are open to Summer Session students, both men and women, as during the regular college year. In accordance with the regular procedure, a fee of \$3 is required of all summer registrants, payable at the time of the regular tuition fee.

## SAGE CHAPEL

Religious services are conducted in Sage Chapel throughout the academic year by clergymen of various religious denominations.

There will be services in the Chapel on five Sundays during the Summer Session, July 13 to August 10 inclusive.

### LECTURES: MUSICAL RECITALS: EXCURSIONS

In addition to the regular classroom work there will be general public lectures on Monday evenings, and also lectures of general interest each week in connection with the work of various departments. They will be all announced in the Weekly Calendar.

Organ recitals will be given on Tuesday evenings in Sage Chapel and on Sunday evenings in Bailey Hall. A piano-lecture recital will be given each week. These entertainments are free to all students.

Two concerts by distinguished artists will be given in the course of the session; see the Calendar on page 3. Students can buy tickets for these concerts at reduced rates.

Wednesday evenings are devoted to the departmental conferences, which are open to all interested persons. Notice of these conferences will be given from week to week.

Excursions, in connection with the work of certain departments, are made to many points of interest. Some of them are open to all members of the Summer Session. Especially noteworthy are the excursions to Watkins Glen and to Niagara Falls.

### RAILROAD ROUTES TO ITHACA

Ithaca can be reached from New York City by either the Delaware, Lackawanna & Western or the Lehigh Valley Railroad. On both roads there are good trains, with Pullman cars, both night and day. Passengers from the west reach Ithaca by way of the Lehigh Valley Railroad from Buffalo. From stations on the Boston & Albany Railroad, the shortest route to Ithaca is by way of Syracuse and Auburn. From Philadelphia, and from Baltimore, Washington, and the south by way of the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh Valley at Bethlehem. From stations on the Erie, connections with Ithaca can be made either by the Lackawanna at Owego or by the Lehigh Valley (Elmira and Cortland branch) at Elmira. Ithaca has connections with the New York Central at Geneva, Auburn, and Canastota.

## COURSES OF INSTRUCTION

In this list the names of the departments of instruction are in alphabetical order. There is an index on page 87.

Most of the courses consist of five exercises a week, or one hour each week day except Saturday. The number of actual hours of class work in any course can be found by multiplying the number of weekly exercises by six.

The word *hour* used with reference to University credit means the equivalent of one class exercise a week for a half-year or one semester. One hundred and twenty such hours are required of candidates for the A.B. degree.

GS signifies *Goldwin Smith Hall*.

### ASTRONOMY

**S 1. General Astronomy.** Credit two or three hours. Lectures and recitations, daily, 8. *Lincoln* 31. Laboratory and observations, T or Th, 8-10 P. M. *Observatory*. Professor BOOTHROYD.

A general introductory course intended especially for teachers who may wish to prepare more thoroughly for teaching general science or geography. The lectures are illustrated by models and by lantern slides and the 12-inch equatorial and other instruments of the Observatory are used for observation and instruction. Tancock's *Elements of Descriptive Astronomy* is used as an outline; other books for reference.

### CHEMISTRY

The courses announced below correspond entirely or in part with courses given during the regular sessions of the University. For regular students the requirements for admission to the various courses will be the same as during the year.

Teachers may be admitted to any course for which their general training or experience may be considered to prepare them. Every effort will be made to meet the individual needs of teachers by arranging and modifying the work as far as possible so as to fulfill the particular requirements in each case.

All courses in Chemistry are given in the *Baker Laboratory of Chemistry*.

**S 101. Introductory Inorganic Chemistry.** Credit three hours. Lectures, daily except Sat., 12. Ten additional lectures at hours to be arranged. *Main Lecture Room*. Professor BROWNE and Mr. HOUPt.

The lectures deal with the fundamental theories and laws of chemistry, and with the more common elements and their compounds. They are profusely illustrated by experiments. The course is primarily designed to meet the needs of teachers in secondary schools, and to that end emphasis is laid upon methods of lecture presentation and experimental demonstration. Students other than teachers must, before registering, satisfy the department that they are properly prepared to carry on the work.

**S 105. Introductory Inorganic Chemistry.** Recitations and laboratory practice. Credit three hours.

Laboratory, M W, 8-12, and T Th F, 9-12. *Rooms* 177 and 150. Mr. ROBEY and Mr. FERGUSON. A series of experiments designed to illustrate the fundamental laws of chemistry and to acquaint the student with the properties of the principal elements and their compounds. For the benefit of teachers who may take the course special attention will be given to the methods of laboratory instruction, quantitative experiments, and the blowing of simple glass apparatus.

Recitations, T Th F, 8. *Room* 22. Mr. FERGUSON. The recitations deal with the subject matter of the lectures and with the experimental work in the laboratory and afford thorough drill in the solution of chemical problems.

**S 205. Introductory Qualitative Analysis.** Credit three hours. Must be taken with Course S 206. Lectures and recitations, daily except S, 8, T Th, 11. *Room 107.* Dr. MURRAY.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

**S 206. Introductory Qualitative Analysis.** Credit three hours. Must be taken with course S 205. Laboratory, daily except S, 1:40-4, and M W, 9-12. *Room 50.* Dr. MURRAY and Mr. AVENS.

A study of the properties and reactions of the common elements and acid radicals; the qualitative analysis of a number of solutions and solid compounds.

**S 210. Introductory Qualitative Analysis.** Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, M W F, 11. *Room 107.* Dr. MURRAY. Laboratory, daily except S, 1:40-4. *Room 50.* Dr. MURRAY and Mr. AVENS.

The properties and reactions of the common elements and acids, and their detection in various liquid and solid mixtures.

**S 220. Introductory Quantitative Analysis.** Credit three hours. Must be taken with Course S 221. Lectures and recitations, daily except S, 8. *Room 202.* Dr. MORSE.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

**S 221. Introductory Quantitative Analysis.** Credit three hours. Must be taken with Course S 220. Laboratory, daily except S, 9-1. *Room 294.* Dr. MORSE and Mr. RAYNOLDS.

The preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

**S 225. Introductory Quantitative Analysis.** Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, T Th, 11. *Room 207.* Dr. MORSE. Laboratory, daily except S, 8-11. *Room 294.* Dr. MORSE and Mr. RAYNOLDS.

The preparation and use of volumetric solutions and work in elementary gravimetric analysis.

**S 230. Advanced Quantitative Analysis.** Recitations and laboratory practice. Credit two to four hours. Laboratory, daily except S, 8-1. *Room 294.* Dr. MORSE and Mr. RAYNOLDS.

Gravimetric, volumetric, and electrolytic methods of analysis, and methods of combustion analysis; the calibration of weights and volumetric apparatus, analysis of iron and steel alloys, silicates, etc.

**S 305. Introductory Organic Chemistry.**

It is recommended that S 305 A and S 310 A be taken in one summer, and that S 305 B and S 310 B be taken in the following summer. In exceptional cases S 305 A, S 310 A, and S 305 B, but not S 310 B may be taken together, by special permission.

A. First term. Credit three hours. Lectures and written reviews. Daily, 8. *Room 207.* Assistant Professor JOHNSON.

B. Second term. Credit three hours. Lectures and written reviews. Daily, 9. *Room 302.* Open to those who have had S 305 A. Mr. TALLMAN.

The lectures discuss systematically the more important compounds of carbon, their occurrence, methods of preparation, reactions, relations, and uses.

**S 310. Introductory Organic Chemistry.**

A. First term. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had or who are taking S 305 A. Hours to be arranged, in the mornings. Mr. TALLMAN, Mr. SCOTT, and Mr. AUSTIN.

B. Second term. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had S 305 A and S 310 A. Hours to be arranged, in the mornings. Mr. TALLMAN and Mr. SCOTT.

The student prepares a number of typical compounds and familiarizes himself with their properties, reactions, and relations.

**S 320. Advanced Organic Chemistry.** Credit two or more hours. Laboratory practice at hours to be arranged, in the mornings. Assistant Professor JOHNSON. An advanced course in the preparation of organic compounds, involving the use of the more difficult classical methods and of the less common reagents.

**S 375. Introductory Organic Chemistry.** Shorter Course. Lectures and written reviews. Daily, 8. Room 207, throughout the session, and also daily, 9, during the latter part of the session only. Assistant Professor JOHNSON.

A shorter course in organic chemistry, designed for students in home-economics, pre-medical, biological, and agricultural curricula. Required of students in certain of these curricula. Credit four hours for lectures and written reviews.

Laboratory practice. Credit one or two hours. Hours to be arranged, in the mornings. Mr. TALLMAN and Mr. AUSTIN.

Students preparing for the study of medicine should learn the requirements in Organic Chemistry of the medical school which they intend to enter, and if more than six hours of credit are required, should register in Chemistry 305 and 310.

**S 405. Introductory Physical Chemistry.**

A. Credit three hours. Lectures, daily except S, 8, and two other lectures at hours to be arranged. Room 7. Professor BRIGGS. A systematic presentation of modern chemical theory. The subject matter includes: gases, liquids, and solids; chemical equilibrium in homogenous and heterogeneous systems; the phase rule and its applications; the theory of solution; the elements of thermochemistry and thermodynamics.

B. Credit three hours. Lectures, daily except S, 9, and two other lectures at hours to be arranged. Room 7. Professor BRIGGS and Mr. BELDEN. A continuation of Part A. The subject-matter includes the theory of solution; ionic equilibria; reaction velocity and catalysis; elementary electrochemistry; colloid chemistry; the application of the phase rule to systems of two and three components.

**S 410. Physical Chemistry Laboratory.** A. Credit three hours. Laboratory practice, daily except S, 8-1. Room 1. Professor BRIGGS and Mr. BELDEN. Open only to those who have taken or are taking Course S 405A or its equivalent. With the data obtained in the laboratory as a basis, detailed reports are written covering each of the following topics: molecular weight determination by vapor density, boiling point and freezing point methods; vapor pressure; viscosity; distillation of liquid mixtures.

B. Credit three hours. Laboratory practice, daily except S, 8-1. Room 1. Professor BRIGGS and Mr. BELDEN. Open only to those who have taken or are taking Course S 405B or its equivalent. The course is a continuation of Part A. The following topics are considered: dissociation; solubility, reactions; reaction velocity and catalysis; indicators; thermochemistry; diffusion; colloids and adsorption; photochemical reactions; phase rule studies of inversion points; solid-liquid, liquid-liquid, compounds.

**S 465. Laboratory Practice in Physical Chemistry.** Credit one to three hours. Laboratory periods to be arranged. Professor BRIGGS and Mr. BELDEN.

This course is designed to afford opportunity for special laboratory practice in physical chemistry, colloid chemistry, or electrochemistry.

**S 505. Introductory Chemical Spectroscopy.** Lectures and laboratory practice. Credit three hours. Lectures, daily except Sat., at hours to be arranged. Room 377. Laboratory practice at hours to be arranged. Room 396. Professor PAPISH and Mr. KETCHAM.

The construction and use in chemical analysis of the spectroscope, polariscope, refractometer, colorimeter, and nephelometer. The laboratory instruction is devoted to training in the use of these instruments in the solving of chemical problems.

**S 520. Spectrographic Methods.** Credit one or more hours. Laboratory practice at hours to be arranged. Prerequisite course S 505. Room 396. Professor PAPISH and Mr. KETCHAM.

Application of photographic methods to arc, spark, and absorption spectroscopy as aids in chemical analysis.



Students not desiring University credit may arrange to cover different branches of chemical spectroscopy to suit their special needs.

**S 530. Introductory Chemical Microscopy.** Lectures and laboratory practice. Credit three hours. Lectures, M W F, 10. *Room 377.* Laboratory, M W F, 11-1, T Th, 10-1; optional, M W, 1:40-4. *Room 378.* Assistant Professor MASON and Mr. FORGENG.

The use of the microscope and its accessories; microscopic methods as applied to chemical investigations; micrometry; the examination of crystalline compounds; recognition of textile and paper fibers, etc. The application of microscopic methods to quantitative analysis.

**S 535. Advanced Chemical Microscopy.** Laboratory practice. Credit three hours. Prerequisite course S 530. Laboratory periods and conference hours to be arranged. *Room 378.* Assistant Professor MASON and Mr. FORGENG.

Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and to the analysis of minute amounts of material.

Students not desiring University credit, who wish to secure a working knowledge of Chemical Microscopy in the shortest possible time, may arrange with the instructor to cover the parts of both of the above courses which best meet their needs.

**S 195, S 295, S 395, S 495, S 595. Research.** Credit one to six hours. Senior chemists, and others by special permission, may elect research in the fields of Inorganic, Analytical, Organic, or Physical Chemistry, or Chemical Spectroscopy, or Chemical Microscopy, under the direction of some members of the staff of instruction.

## DESIGN

**S 1. Architectural Design.** Maximum credit six hours. *White.* Professor BURNHAM.

Registration is limited to technical students properly qualified. The course will be withdrawn if too few apply. Consult the instructor.

A continuation of courses in the College of Architecture; major and minor problems in design; the work approximates that of a regular term.

## DRAWING: PAINTING: HISTORY OF ART

**S 1. Elementary Drawing.** Credit two hours. Daily except Sat., 2-4. *Franklin.* Mr. WASHBURN.

This course for beginners in drawing embraces freehand perspective, drawing of geometrical objects and simple casts. The course will begin with pencil work and continue with light and shade in charcoal.

**S 2. Elementary Color.** Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE.

Instruction for beginners in color. Students work in pastel from simple groups of objects. Talks will be given on the theory of color.

**S 4. Antique.** Credit two hours. Daily except Sat., 2-4. *Franklin.* Mr. WASHBURN.

Prerequisite for this course is a knowledge of the elements of drawing. Instruction will be given in charcoal from casts.

**S 5. Advanced Color.** Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE.

As in elements of color, students in advanced color work from groups (vases, fruit, flowers) in oil or in water color. Those who have not had elements of color may enter this course on submission of examples of original work. Copies of others' work will not be sufficient for entrance.

**S 6. Outdoor Sketching in Color.** Credit two hours. Daily except Sat., 2-4. *Franklin.* Assistant Professor STONE.

A knowledge of the elements of drawing and the elements of color is a prerequisite to this course. Instruction is given in water color or oil from landscape.

The unusual variety and charm of the natural environment of Cornell give an abundance of subject-matter from which to work. There are woodland, open farming country, lakes and streams, broad panoramic views, and rugged gorges within easy walking distance of the campus. The student is therefore inspired by surroundings of unique beauty.

**S 7. Drawing from the Human Figure.** Daily except Sat., 10-12. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

Study from living model in charcoal. Courses S 1 and S 4 or their equivalent are prerequisite to this course. A Studio fee of ten dollars is charged.

**NOTE.** All materials needed in any of these courses may be obtained in Ithaca.

**S 15. History of Ancient Art.** Credit two hours. Daily except Sat., 10. *White 33.* Assistant Professor FINLAYSON.

A general survey with emphasis on Greek sculpture.

**S 17. History of Florentine Painting.** Credit two hours. Daily except Sat., 11. *White 33.* Assistant Professor FINLAYSON.

A survey of the development of Florentine painting from the fourteenth to the sixteenth century.

### ECONOMICS AND SOCIOLOGY

The following courses are designed to meet the needs of three classes of students in the Summer Session: (1) those desiring regular college credit for general economics; (2) students with special interests in economic subjects; (3) students seeking broad preparation for the teaching of economics in the secondary schools. For the first group, Course S 1 covers the subject matter usually included under elementary economics. For Cornell students, Course S 1 satisfies the economics requirement in the College of Engineering and will also serve in lieu of Course 1 as a prerequisite for admission to various advanced courses in economics. Graduate students wishing to pursue special investigations will be afforded assistance by other members of the Department of Economics of the University who may be in residence in Ithaca during the summer.

**S 1. Modern Economic Society.** Credit four hours. Twice daily except Sat., 11 and 12. *GS 142.* Assistant Professor O'LEARY.

A survey of the existing economic order, its more salient and basic characteristics, and its operation.

**S 5. Current Economic Problems.** Credit two hours. Daily except Sat., 8. *GS 264.* Assistant Professor MONTGOMERY.

A course designed to afford students who have taken an introductory course in Economics the opportunity to become acquainted in a general way with the more important economic problems of the day—tariff problems, reparations problems, railroad problems, trust problems, labor problems, problems of the farmer, conservation problems, and problems of taxation and public finance.

**S 13. Corporation and Investment Finance.** Credit two hours. Daily except Sat., 9. *GS 264.* Professor REED.

A study of the financial problems of the business corporation from the point of view of the management and of the investor.

**S 15. Trade Fluctuations—Business Forecasts.** Credit two hours. Daily except Sat., 11. *GS 264.* Professor REED.

A study of the causes and effects of trade recessions and revivals. The forecasting methods of some of the more prominent investment services, as well as the course of the stock market, will receive attention.

**S 43. Trade Unionism and Labor Problems.** Credit two hours. Daily except Sat., 10. *GS 264.* Assistant Professor MONTGOMERY.

A study of the origins, development, philosophies, aims, and policies of unions, and of the chief problems growing out of the position of the worker in modern economic society.

**S 50a. Introduction to Sociology.** Credit two hours. Daily except Sat., 9. *GS 142.* Professor REUTER.

This course is designed to orient the student in the social sciences and to give a working system of thought about society. It includes a consideration of funda-

mental human nature; the relation of the individual to the group; isolation and social interaction; social forces and social unity; collective behavior; social control through education, religion, and social pressure; and theories of social progress.

**S 52. American Race Problems.** Credit two hours. Daily except Sat., 10. GS 142. Professor REUTER.

A study of the Negro in America with attention to the basic mental and temperamental traits of the black man; the effect of his contact with the white race; the conflict and accommodation of the races; the increasing intimacy with the white man's civilization; isolation; prejudice, and the growth of racial consciousness; the rôle of the mulatto; and the evolution of a biracial system of control.

## EDUCATION

Courses S 1, S 2, S 3, and S 4, will be found especially helpful to college graduates who are preparing for examinations in professional subjects as outlined in the New York State Syllabus and Course of Study for the renewal of the College Graduate Certificate Limited. The State Department of Education will hold an official examination for such candidates at Ithaca on August 11 and 12.

Under certain conditions teachers may waive the state examination by completing an approved course of study in the Summer Session. Information regarding details of such a course may be had by consulting Professor R. H. JORDAN, Goldwin Smith Hall 252, either in person or by letter.

**S 1. Educational Psychology.** Credit two hours. Daily except Sat., 11. GS 256. Assistant Professor FREEMAN.

A study of the learning process and its application to educational theory and practice; the original nature of man; reflex action and instinct; memory, learning, and reasoning; individual differences, and social co-operation.

**S 2. Principles of Education.** Credit two hours. Daily except Sat., 8. GS 245. Professor CROSBY.

A study of education from the sociological standpoint: infancy, heredity, and eugenics; the problem of aim; formal discipline; social and personal objectives; the curriculum; the studies and their functions.

**S 3. History of Education.** Credit two hours. Lectures, recitations, and prescribed readings. Daily except Sat., 12. GS 256. Mr. HULSE.

The purpose of this course is to give an understanding of present educational values and practices through an historical consideration of their origin and development.

The topics treated are to a great extent those emphasized in the syllabus for the New York State Teachers' Certificate; education in primitive and barbaric societies; the rise of the school as an institution; Greek and Roman education; scholasticism, humanism, and realism; the 'psychological' movement; the origin and nature of specifically modern tendencies in education.

**S 4. Secondary School Methods.** Credit two hours. Daily except Sat., 10. GS 256. Mr. HULSE.

A study of the principles underlying vital instruction in its intellectual, emotional, and motor phases: the use of supplementary devices; the project; motivation; types of subject matter; lesson assignment; questioning; the art of study; supervised study; tests and examinations; lesson planning; class management.

The course is planned to meet the New York State Certificate requirement in general method, and is adapted especially to the needs of younger and relatively less experienced teachers. Teachers of longer experience are referred to Course S 226.

**S 5. High School Administration.** Credit two hours. Daily except Sat., 9. GS 256. Dr. KLOPP.

A study of the principles basic to administration of the senior and junior high school; the course of study; principles of election; classification of pupils; use of intelligence and achievement tests; the principal as supervisor; building problems; selection and rating of teachers; schedule-making; problems growing out of the experience of the class.

**S 7. Mental Measurements.** Credit three hours. Lectures, prescribed readings, and laboratory. Daily except Sat., 10. *GS* 245. Laboratory hours to be determined. Professor CROSBY.

The nature of intelligence. The history of the development of individual and group tests of intelligence; principles underlying their formation and application; the use of tests of intelligence in dealing with defective and superior children, and with problem cases; their use in general school problems, and in fields outside the school. The theory, construction, and use of educational tests. Demonstration and practice in administering tests.

**S 8. Advanced Mental Measurements.** Credit two to three hours. Daily except Sat., 8. *GS* 227. Laboratory at hours to be determined. Prerequisite Education S 7 or its equivalent. Assistant Professor FREEMAN.

A detailed and critical investigation of some of the chief problems of mental measurements; their theoretical and practical bearings.

**S 9. Special Problems in Education.** Professor JORDAN will advise students majoring in the Department of Education; students majoring in rural education may consult any member of that Department.

This course is designed to give advanced students an opportunity for study of special problems under personal direction of instructors. The work may consist either of essays and reports on some special topic, or of laboratory practice of an advanced grade. Students interested in work of this nature should consult with some member of the resident staff.

**S 10. Problems in School Administration.** Credit two hours. T Th, 1:40-4. *GS* 236. Professor JORDAN.

A study of administration of school systems, together with problems peculiar to the administration of secondary schools. The course follows a four-year cycle of material, especially arranged to give graduate students a continuous four-year course. Students may enroll in any unit of this course, and particular attention is paid to the needs of each group. Open, by permission of the instructor, to graduate students and to teachers of experience. Papers and reports required.

**S 11. Extra Classroom Activities.** Credit two hours. Daily except Sat., 8. *GS* 256. Professor JORDAN.

A study of the place extra classroom activities should assume in the school program. General principles involved, with special attention given to athletics, dramatics, publications, school finance, music, debate, and school clubs. Individual problems of the class will have special attention.

**S 14. The Junior High School.** Credit two hours. Daily except Sat., 10. *GS* 221. Mr. MEYER.

Among the topics considered in this course are: the development of the junior high school idea; the special purposes of the junior high school; types of administrative organization, bases of determining curriculum content and organization; critical analysis of representative curricula and courses of study; special problems of pupil activities, pupil guidance and adjustment.

**S 17. The Curriculum of the Junior-Senior High School.** Credit two hours. Daily except Sat., 12. *GS* 264. Mr. MEYER.

Special emphasis will be placed upon the curriculum in its relation to the large aims of the secondary school. The complementary nature of the junior and senior high school will receive particular attention.

**S 18. School Supervision.** Credit two hours. Daily except Sat., 11. *GS* 183. Dr. KLOPP.

The principles and applications of supervision of city and town school systems, involving problems of evaluation and improvement of teaching, and of subject matter. Open to both supervisory officers and teachers. The course will attempt to meet the particular needs of the class.

**S 20. Practice in High School Method.** Credit one to three hours. Hours to be arranged. *GS* 251. Mr. HULSE.

This course is limited to students needing credit in practice teaching to meet specific state requirements. Application must be made before June 1 to Mr. M. L. Hulse, 251 Goldwin Smith Hall, Ithaca, N. Y. The work will involve

daily observation and practice in the Ithaca High School Summer Session under supervision of selected teachers and under the general direction of the Department of Education. Frequent conferences will be held with the instructor in charge.

**S 30. Teachers' Course in Social Studies in Senior High School.** Credit two hours. Daily except Sat., 10. *GS 225.* Mr. KIDGER.

This course considers the content and method of teaching social studies in the senior high school. The interrelation of geography, history, and civics will be emphasized. Especial attention will be given to the most effective methods not only in presenting American history but also in dealing with problems of democracy. A consideration of individual method of measurements, and effective methods of testing, the use of outside reading, maps, charts, diagrams, note books.

**S 125. The Teaching of Reading.** Credit two hours. Daily except Sat., 2. *Caldwell 143.* Miss HICKS.

This course deals with the various phases of the reading process. Attention will be given to diagnosis, remedial work, types of reading, material suitable for the various grade levels, recent investigations and recommendations. The course is designed for teachers, principals, and supervisors.

**S 226. Foundations of Method.** Credit two hours. Daily except Sat., 10. *GS 183.* Professor HARPER.

This course is designed primarily for experienced elementary and high school teachers and supervisors. It will include a critical examination of current and proposed educational methods in the light of accepted principles of educational psychology. Special attention will be given to the theories involved in project-teaching. The course will include such topics as the laws of learning, interest and effort, the thinking process, the organization of experience, the relationship between subject matter and the educative process, discipline and moral training.

**S 282. Educational and Vocational Guidance.** Credit two hours. Daily except Sat., 8. *Caldwell 100.* Dr. BROWNELL.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

## ADDITIONAL COURSES IN EDUCATION

Attention is called to the announcement of the Department of Rural Education on p. 71. In addition to courses of strictly rural character, a number of courses of general educational nature are open to all students of the Summer Session.

## TEACHERS' COURSES IN HIGH-SCHOOL SUBJECTS

The following courses are offered for teachers desiring to study problems of instruction in different high-school subjects. The courses are planned also to meet the requirements of the New York State Department of Education in the issuance of the College Graduate Life Certificate.

TEACHERS' COURSE IN ENGLISH. See English S 5.

TEACHERS' COURSE IN HISTORY. See History S 17.

TEACHERS' COURSE IN SOCIAL SCIENCE. See Education S 30.

TEACHERS' COURSE IN HEALTH EDUCATION. See Health Education S 4.

TEACHERS' COURSE IN LATIN. See Latin S 1.

TEACHERS' COURSE IN MATHEMATICS. See Mathematics S 20.

TEACHERS' COURSE IN MUSIC. See Music S 30, S 32.

TEACHERS' COURSE IN PHYSICS. See Physics S 90.

TEACHERS' COURSE IN PUBLIC SPEAKING. See Public Speaking S 3, S 31.

TEACHERS' COURSE IN ROMANCE LANGUAGES. See French S 33, Spanish S 11.

## PHYSICAL EDUCATION

Attention is called to the courses in Physical and Health Education on pages 43-44 of this announcement.

## PHOTOGRAPHY FOR TEACHERS

See under Photography, page 45.

## ENGINEERING

The courses in engineering described below are equal in character to corresponding courses given in the College of Engineering during the regular session. They will be accepted for credit towards graduation by the several schools of the college so far as they apply to the prescribed work of the school concerned. Students in the College of Engineering who may desire to offer work done in the Summer Session toward graduation should consult the Director of the school in which they are regularly registered before registering in the Summer Session. Others may obtain information concerning these courses by applying to the Secretary of the College of Engineering.

Additional courses in Structural Engineering and in Hydraulics may be arranged to meet the needs of graduate students.

## DRAWING

**S 3. Elementary Engineering Drawing for Secondary Schools.** Drawing Room open daily except Saturday 9-4, daily except Wednesday and Saturday 2-4:30. Hours to suit. *East Sibley 207.* Professor TOWNSEND.

This course is designed for those who wish to teach mechanical drawing in secondary schools and for those who feel the need of a more complete knowledge of this subject to assist them in teaching shop work. Some of the topics covered are use of instruments, lettering, orthographic and isometric projection, inking, tracing, conventions, and working drawings. Students familiar with these topics may elect a more advanced course.

Students must be provided with a set of drawing instruments, an architect's scale, a  $30^\circ \times 60^\circ$ , and a  $45^\circ$  triangle.

**S 123. Engineering Drawing.** Hours the same as for S 3. *East Sibley 207.* Professor TOWNSEND.

This course includes such subdivisions as use of instruments, simple projections, free-hand sketching, lettering, conventional signs, working drawings, tracing, blue-printing, etc. The content of this course is equivalent to that of Drawing 123 given during the regular term.

**S 125. Engineering Drawing.** For candidates for the degree of B. Chem. Hours the same as for S 3. *East Sibley 207.* Professor TOWNSEND.

Content of the course the same as S 123 with the substitution of isometric projection and a problem in piping and pipe conventions. The content of this course is the same as Drawing 125 of the regular term.

## DESCRIPTIVE GEOMETRY

**S 10. Descriptive Geometry.** Lectures, daily except Sat., 9. Recitations and drawing, daily except Sat., 10-12, and 2-5. *Lincoln.* Assistant Professor POND.

A study of the representation of lines, planes, surfaces, and solids, and their interrelations. Warped surfaces, tangencies, intersections, and perspective. The work is the same as that given in the regular C. E. courses 205 and 206; and the student will receive four hours of credit if he takes the whole course. A three-hour course that does not include perspective, and fulfills the requirements of course 124 of the Sibley School of Mechanical Engineering and the School of Electrical Engineering will also be given in both the morning and the afternoon sections. The morning and afternoon sessions make it possible to readjust the schedule so as to accommodate nearly all who may wish to take either course. Those who take course 124 may do their work in the 9-12 period or in the 2-5 period.

## KINEMATICS

**S 313. Kinematics.** Credit three hours. This course is the equivalent of 313 and must be taken with course S 314. Prerequisite courses Physics 6, 330, 311, and 124. Eight recitations a week on the theory of mechanism, instant centers, cams, gears, linkages, velocity and acceleration diagrams. Daily except Sat., 9, and M W F, 12. *East Sibley 108.* Professor ROGERS.

**S 314. Kinematic Drawing.** Credit two hours. This course is the equivalent of 314 and must be taken with course S 313. Prerequisite courses Physics 6, 330, 311, and 124. Drawing board application of the theory and principles of course S 313 in the construction of cams and gears, the solution of linkage and instant center problems, and the determination of velocity and acceleration diagrams, etc. Any five of the following three-hour drawing periods: T Th, 10-1, M T W Th F, 1:40-4. *East Sibley 103.* Professor ROGERS.

#### MECHANICS OF ENGINEERING

The following courses in Mechanics of Engineering are open to students from other universities, subject to the same requirements for admission as are made for Cornell students. See the Announcement of the College of Engineering for more detailed description of Courses 220, 221, 223, 330, and 331. Professors RETTGER and GARRETT, Assistant Professor PERKINS. Office, *Lincoln 33C.*

**S 220. Mechanics.** Credit six hours. Equivalent to C.E. 220. Recitations, daily, 9 and 12; and three computing periods a week.

**S 221. Mechanics.** Mechanics of Materials. One section. Credit four hours. Equivalent to C.E. 221. Prerequisite course 220 or the equivalent. Recitations, daily except Sat., 8 and 11; and two computing periods a week. See S 221A.

**S 221 A. Mechanics Laboratory.** Equivalent to C.E. 221A. Must be taken with S 221. Hours to be arranged.

**S 223. Engineering Problems.** Credit two hours. Equivalent to C.E. 223. Five computing periods a week. Will be given only if enough students register for the course.

**S 330. Mechanics.** Credit six hours. One section. Twelve recitations a week and three computing periods. Equivalent to M.E. 330. Recitations, daily, 9 and 12. Computing periods to be arranged.

**S 331. Mechanics of Materials.** Credit five hours. One section. Eleven recitations and two computing periods a week. Equivalent to M. E. 331. Prerequisite course 220 or 330, or the equivalent. Recitations, daily, 8 and 10. Computations to be arranged.

#### MATERIALS OF CONSTRUCTION

**S 225. Materials of Construction.** Credit three hours. The materials studied are: Lime, cement, stone, brick, sand, timber, ores, cast iron, wrought iron, steel, and some of the minor metals and alloys. The chemical and physical properties, uses, methods of manufacture, methods of testing, and unit stresses of each material are considered, particular emphasis being laid on the points of importance to engineers. 9. Professor SCOFIELD.

**S 226. Materials Laboratory.** Credit three hours. Prerequisite course S 221; and should preferably be taken with or preceded by 280. Experimental determinations of the properties of materials by mechanical tests. Study of testing machines (their theory, construction, and manipulation); calibration of testing machines and apparatus; commercial tests of iron and steel; tensile, compressive, torsional, shearing, and flexure tests of metal and various woods with stress-strain observations; tests of cement, concrete aggregate, concrete plain and reinforced, and of road material and paving brick. The course is planned to supplement Course S 225 with its study of the properties of materials by the actual handling of the materials and by observations of their behavior under stress. Laboratory work, 10:30-12:50. Professor SCOFIELD.

#### HYDRAULICS

**S 240. Hydraulics.** Credit four hours. Prerequisite courses 220, 221, or 330, 331. Five recitations and three computing periods a week. Ten demonstration lectures are given in periods to be arranged. Daily except Sat., 10; M W F, 1:40-4. The Schools of Mechanical and Electrical Engineering will accept this course for 334 or 335. Professor SCHODER.

Text: Schoder and Dawson, *Hydraulics*.

Hydrostatics, including stability of gravity dams, immersion and flotation, gas volumes and pressure; flows of liquid through orifices, nozzles, Venturi meters, pipes, and over weirs; time required to fill and empty tanks and canal locks; simple, compound, branching, and looping pipes; elementary power calculations in common pumping and fire protection problems. Flow of water in open channels. Elementary consideration of modern water wheels.

#### STRUCTURAL ENGINEERING

**S 270. Structural Design and Bridge Stresses.** Credit four hours. Lectures and recitations, daily except Sat., 8; computations and drawings at hours to be assigned. *Lincoln* 14 and 29. Prerequisite C.E. 220, 221. Assistant Professors BURROWS and O'ROURKE.

One-fourth of the course includes structural details, i. e., the design of a wooden roof truss and other timber joints. The remainder of the course includes dead load, live load, and impact stresses in simple bridge trusses due to uniform live panel loads, locomotive axle loads, and highway loads. Text: Urquhart and O'Rourke, *Stresses in Simple Structures*.

**S 271. Structural Design.** Credit three hours. Lectures, computations, and drawing. Daily, 10:30-12:50. *Lincoln* 14. Prerequisite C.E. 270. Assistant Professor BURROWS.

An elementary course in steel design. Complete design, detail drawing, bill of material, and estimate of weight of a steel roof truss, a through and a deck-plated girder bridge.

**S 274. Bridge Design.** Credit three hours. Computation and drawing, daily, 10:30-12:50. Prerequisite C.E. 271. Assistant Professor BURROWS.

Computations and drawing for the complete design of a riveted railroad or highway bridge. The computations to determine the sections of all members, joints, splices, and other details are to be written up in systematically arranged reports. The drawing consists of general plans showing the location of all rivets as well as the composition and relation of all members and connections. The final reports are to give a full list of shapes and plates, and a classified analysis of weight for the span.

**S 280. Concrete Construction.** Credit three hours. Daily, 9-10:30. Prerequisite courses C.E. 220, 221, (see announcement of S 226). Professor URQUHART and Assistant Professor O'ROURKE.

Concrete materials, properties of plain concrete, its making and deposition; elementary theory of reinforced concrete as applied to columns, rectangular beams, and slabs; T-beams reinforced for compression; direct stress combined with flexure. Text: Urquhart and O'Rourke, *Design of Concrete Structures*.

**S 281. Foundations.** Credit three hours. Daily except Sat., 8. Prerequisite courses 220 and 221. Piles and pile driving, including timber, concrete, tubular, and sheet piles; cofferdams; box and open caissons; pneumatic caissons for bridges and buildings, caisson sinking, and physiological effects of compressed air; pier foundations in open wells; freezing process; hydraulic caissons; ordinary bridge piers; cylinders and pivot piers; bridge abutments; spread footings for building foundations; underpinning buildings; subterranean explorations; unit loads. Text: Jacoby and Davis, *Foundations of Bridges and Buildings*. Recitations, collateral reading in engineering periodicals, and illustrated reports. Professor URQUHART

**S 282. Reinforced Concrete Building Design.** Credit three hours. Daily except Sat., 10:30-12:50. Prerequisite course C.E. 280. Assistant Professor O'ROURKE.

Design of a reinforced concrete flat-slab building and an investigation of various other types of floor systems for commercial buildings. Complete detail design for one building, including stairways, elevator shafts, penthouses, etc. Working drawings and steel schedules.

**S 285. Reinforced Concrete Design.** Credit three hours. Daily except Sat., 10:30-12:50. Prerequisite course 280. Professor URQUHART.



Theory and design of gravity, cantilever, and counterfort retaining walls. Design of multiple column footings of reinforced concrete. I-beam grillages. Design of bins and tanks: subsurface and supported on towers. Reports and sketches.

## ENGLISH

Courses S 1 and S 2 taken together will be considered the equivalent of either the first term or the second term of Course 1 or of Course 3 in the regular University session, but not of both.

S 1. **Composition.** Credit two hours. Daily except Sat., 8. GS 142. Mr. BALDWIN.

A study of the elementary principles of composition, intended to teach the habit of clear and correct expression; reading of models, frequent writing of themes, class discussions; personal conferences at hours to be appointed.

S 2. **Introductory Course in Literature.** Credit two hours. Daily except Sat., 9. GS 124. Mr. BALDWIN.

A study of selections from Shakespeare, Milton, and writers of lyric poetry, intended to acquaint the student with works of the masters of English literature.

S 4. **Advanced Composition.** Credit two hours. Daily except Sat., 11. GS 164. Dr. KESSEL.

The planning, writing, and criticism of essays and of other exercises in composition, accompanied by a study of general principles of writing and of questions of English usage. Open only to teachers and to students who have had one year of college English.

S 5. **Teachers' Course.** Credit two hours. Daily except Sat., 10. GS 156. Professor NORTHUP.

Lectures, readings, reports, and discussions. Designed for those who are teaching or who expect to teach English in schools. The organization of the high school course in English; methods of treating the works named by the Conference on Uniform Entrance Requirements in English; the teaching of literature in general; supplementary reading for pupils and teacher; the use of the school library and the public library; stage productions; the place of language and grammar in the high school; problems of oral and written composition; the relation of composition to literature and to other subjects in the curriculum.

S 6. **Nineteenth Century Poetry.** Credit two hours. Daily except Sat., 12. GS 156. Dr. KESSEL.

A study of the poetry of Wordsworth and Coleridge, and of their relations to the revolutionary movement and to the new birth of English poetry. Texts: *The Poetical Works of Wordsworth*; *The Poetical Works of Coleridge*, Oxford edition.

S 7. **Nineteenth Century Poetry.** Credit two hours. Daily except Sat., 9. GS 156. Assistant Professor GREENE.

A study and discussion of the most important poems of Byron, Shelley, and Keats.

S 11. **American Literature.** Credit two hours. Daily except Sat., 8. GS 156. Professor SIBLEY.

A study of the American poets of the nineteenth century with particular attention to Bryant, Poe, Whittier, Longfellow, Lowell, Holmes, Emerson, and Whitman. Text: Page, *Chief American Poets*.

S 12. **Victorian Literature.** Credit two hours. Daily except Sat., 12. GS 162. Assistant Professor GREENE.

A study of some typical Victorian prose and poetry, including essays of Carlyle and Arnold, and poems of Clough, Swinburne, Morris, Rossetti, Arnold, Tennyson, and Browning.

S 16. **The English Language.** Credit two hours. Daily except Sat., 9. GS 162. Assistant Professor MONROE.

A study of some significant features in the growth and development of the mother-tongue: language and grammar in general; some misconceptions about the life of language; the relationships of English; phonetics, with practical exercises;

the English vocabulary; inflections; native resources and foreign influences; disputed usages; the bearing of historical grammar on present forms and usages, spoken and written.

Recitations, lectures, collateral reading. The course does not require previous knowledge of Old or Middle English.

**S 17. Modern Drama.** Credit two hours. Daily except Sat., 10. GS 162. Professor STRUNK.

A study of some of the outstanding dramatists of our time: Ibsen, Benavente, Shaw, Pirandello. Discussion of the general principles of dramatic construction, and reading of assigned plays. Open only to those who rank as upperclassmen.

**S 18. Old English.** Credit two hours. Daily except Sat., 11. GS 162. Assistant Professor MONROE.

This course is intended for students who, lacking the opportunity hitherto, now wish by earnest effort to acquire some knowledge of English in its early form. Lessons in grammar are followed as soon as possible by the reading of easy prose of the time of Alfred the Great.

The course may be taken by undergraduates; and, with additional reading, by graduates as a part of their work for the master's degree.

**S 20. Shakespeare.** Credit two hours. Daily except Sat., 11. GS 156. Professor STRUNK.

A study of the comedies, with emphasis upon the art of Shakespeare as a playwright. Intended for upperclassmen and graduates.

#### COURSES EXCLUSIVELY FOR GRADUATES

**S 30. English Literature.** For graduates only. Hours and room to be arranged. First meeting Wednesday, July 9, 3 P. M. GS 164. Professor NORTHUP.

Designed especially as an introduction to the graduate study of literature but open also to students who have already done some graduate work. The special topic for the present session is *The Origins of the Drama*.

**S 33. Poetry.** For graduates only. Daily except Sat., 10. GS 160. Professor SAMPSON.

A study of stanzas and kindred forms in English poetry.

**S 34. Modern Poetry.** For graduates only. Daily except Sat., 11. GS 160. Professor SAMPSON.

Contemporary poetry, with particular reference to Robert Bridges's *The Testament of Beauty* and to the collected poems of Edwin Arlington Robinson.

#### GEOGRAPHY AND GEOLOGY

The lecture rooms and laboratories are in *McGraw Hall*. It is the purpose of this department to meet, primarily, the needs of teachers in grammar schools, high schools, normal schools, and colleges. A second aim is to provide courses of practical and cultural value to college students. The work embraces lectures, laboratory, and field instruction in physical, commercial, and regional geography, and in the elements of geology. The environs of Cornell University are rich in phenomena of geographic and geologic interest. Field excursions, consequently, are made an especially important part of the work of this department in the Summer Session. The laboratories are well equipped with apparatus and illustrative material for instruction. The material includes teaching and reference collections of minerals, rocks, fossils, maps, photographs, models, and more than five thousand lantern slides.

Students planning to take work in the department should, if possible, consult the instructor and register for courses on Saturday, July 5, at rooms indicated.

The attention of prospective students in the Summer Session who are especially interested in geographic and geologic studies is invited to courses given in other departments, courses which afford opportunities for additional instruction in these studies. Such courses are described in other pages of this pamphlet under the heads of ASTRONOMY and of METEOROLOGY AND CLIMATOLOGY.

## LECTURE COURSES IN GEOGRAPHY AND GEOLOGY

**S 1. Physical Geography.** Credit two hours. Daily except Sat., 9. *Geological Lecture Room, McGraw Hall* (first floor, south end). Professor ELSTON.

An introductory course in physical geography, including discussion of the origin and form of the continents; the uplift and denudation of the land; the physiographic functions of the atmosphere, ground water, streams, winds, and glaciers; the glaciation of North America; the elements of oceanography.

The lectures in physical geography are fully illustrated by lantern slides and by wall and globe maps. Students registering in this course are advised to take also the related courses S 8 and S 10.

**S 2. Industrial and Commercial Geography.** Credit two hours. Daily except Sat., 8. *Geological Lecture Room.* Mr. BROWN.

The geographic factors affecting production and distribution of commodities. Discussion of the geographic origins and nature of commercial-exchange of goods, routes of commerce, localization of industry, utilization of regional lands of the world.

**S 3. Human Geography.** Credit two hours. Daily except Sat., 11. *Geological Lecture Room.* Professor ELSTON.

A study of the interrelations between man and environment. The fundamental principles of geography with illustrative examples taken from all continents with emphasis upon the study of the earth as the home of man and upon his responses to his natural surroundings.

The course is designed to meet the needs of both teachers and students and offers (1) a systematic grounding in the subject, (2) a critical view of the relation of man to a varied and varying environment.

Lectures, reference readings, discussions.

**S 5. Geology.** Credit two hours. Daily except Sat., 10. *Geological Lecture Room.* Dr. BURFOOT.

An introductory course in geology, consisting of lectures and assigned readings upon the following topics: origin of the earth; geologic history of the earth; materials of the earth's crust and their arrangement, as well as the forces modifying them; vulcanism, earthquakes, and similar phenomena; development of life on the earth.

The lectures will be illustrated with lantern slides, models, maps, and specimens. Students registering for this course are urged to take the laboratory Course S 9 and, if possible, Course S 10. Credit for Geology course 100 regular session will be allowed only for successful completion of all three courses S 5, S 9, S 10.

**S 6. Mineral Resources.** Credit two hours. Daily except Sat., 8. *General Geological Laboratory.* Assistant Professor STOW.

A course in which the principal mineral resources both metallic and non-metallic of the United States will be discussed with reference to the following points: distribution, mode of occurrence, uses, relative importance, rank of the United States among nations of the world in production, and the influence of the various deposits upon the development of the regions in which they occur.

An exceptionally complete collection of specimens is available as illustrative material for this course.

**S 7. Historical Geology.** Credit two hours. Daily except Sat., 11. *General Geology Laboratory.* Dr. BURFOOT.

This course deals with the geographic conditions and the animal and plant life of the various subdivisions of geologic time. The development of the groups of the animal and vegetable kingdoms is traced throughout the geologic periods and studies made of fossils both in the collections and on field trips. This course may be taken alone or with either S 1 or S 5. Students taking it are urged to take S 10, as stratigraphic features are pointed out on all the field trips.

## LABORATORY AND EXCURSION COURSES IN BOTH GEOGRAPHY AND GEOLOGY

**S 8. Physical Geography, Laboratory Course.** Credit one hour. T Th, 2-4. *Physical Geography Laboratory.* Mr. BROWN.

The members of this class will make a study of the physiographic regions of the United States, using contour maps, models, and the experimental laboratory of the department. By such study topographic, regional, and life relationships (human, animal, and plant) will be correlated. There will be given also exercises on the other physiographic topics generally included in a laboratory study of the subject. The course will prove of worth to teachers of geography in the grades who wish to obtain a broader basis for their work in the subject as well as for those who expect to teach geography in the high schools.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

**S 9. Geology, Laboratory Course.** Credit one hour. W F, 2-4. *General Geology Laboratory.* Miss ST. JOHN.

This course is designed to supplement course S 5. A study will be made of the more common structural phenomena; of the interpretation and uses of geological maps; of characteristic life forms developed in different geological periods; and of the more common rocks and minerals. Short field excursions will be made to collect both rock specimens and fossils.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

**S 10. Geography and Geology, Field Course.** This course should be elected by all those registering in Course S 1 or S 5. With courses S 1 and S 8 it affords a comprehensive course in physical geography; with courses S 5 and S 9 it will give a similarly broad training in elementary geology, as the dynamic phases of geology are emphasized on the excursions. Mimeographed outlines of the excursions are to be secured by each student desiring credit. See also a pamphlet, obtainable in Ithaca, on *The Geography and Geology of the Cornell Region*. Assistant Professor STOW, Dr. BURFOOT, Mr. BROWN, and other members of the staff.

Those desiring University or entrance credit must take field notes and hand in written reports. Excursions 1, 2, 3, 4, 5, are required of all students in the course, and in addition for one hour's credit they must take their own choice, two of the three all-day excursions 6, Taughannock, 7, Watkins, and 8, Tully-Jamesville.

Meeting place and time announced in mimeographed outlines or by bulletin. Meet for first excursion, Monday, July 7, at McGraw Hall, 2:10 P. M. or East Ithaca R. R. Station, 2:30 P. M. Excursions 1-5, Monday afternoons; 6, 7, 8, all day Saturday. On the excursions to which a cost is attached persons wishing to go must register at the department and secure tickets in advance of the date of the trip. Announcements regarding field trips are posted on the South Door of McGraw Hall and all arrangements for reservations and tickets are made in the *Physical Geography Laboratory*. The trips are open to others besides the members of the excursion class as far as accommodations are available. Students desiring credit or certificates of attendance must register in S 10 and will be given preference in accommodations.

The longer excursions will be in charge of Assistant Professor STOW, with the cooperation and assistance of the other members of the instructing staff. On the excursions stops will be made at points of interest, explanations made, questions asked, and discussion invited.

## OUTLINE OF EXCURSIONS: COURSE S 10

*Monday Afternoons*

1. **Eagle Hill.** To become acquainted with the lie of the land about Cornell, to learn the place names of the broader physiographic features, studying enroute processes of weathering, and, at the summit, the maturely dissected plateau. The top of the hill is a vantage point from which a good view of the lake and the land for miles to the north, east, and west may be had. July 7.

2. **Fall Creek and Deadhead Hill.** To study the origin and nature of sedimentary rocks, also processes of erosion, transportation, deposition, and cementation. An intimate view of one of the large gorges and its special features, particularly Ithaca Falls. July 14.

3. **Portland Point.** By auto-bus. To study rock structure; intrusion of igneous rocks into sedimentary formations; rock-folding and small scale faulting and associated phenomena; vein-formation; fossil content of strata; economic utilization for cement. July 21.

4. **Enfield Gorge and Falls.** By auto-bus. To study the relations of preglacial and hanging valleys and the postglacial and interglacial gorges, their origin and features. Joint-plane guidance of stream courses. A ride to the head of the gorge, climb through it to the lower end past the crest of Lucifer Falls. Enfield is perhaps the most picturesque and wildest of the gorges in the Cornell region. July 28.

5. **Terminal Moraine.** North Spencer. By auto-bus. To study a massive morainic loop, the basin in which the former ice tongue rested, and the outwash deposits and overflow channels to the south. Truncated valley sides due to glacial erosion. The most striking examples of glacial phenomena in the Cornell region. August 4.

#### *All-day Excursions*

6. **Taughannock Gorge and Falls.** By steamer. To study the Inlet Plain, its reclamation, the Barge Canal terminal, the position and succession of the Devonian strata along the lake shore, and the deep gorge and falls of Taughannock, one of the highest straight falls east of the Rockies. Luncheon at the foot of the falls. July 12.

7. **Watkins Glen.** By auto-bus. Watkins Glen is one of the most beautiful scenic spots in the country. The excursion party will study the gorge, its pot holes, and its falls in detail; and consider its relations to the Seneca Lake valley in comparison with the conditions at Ithaca in relation to the Cayuga valley. Luncheon at the head of the gorge. July 19.

8. **Tully, Jamesville Lake, and Onondaga Escarpment.** By auto-bus. This trip provides for a study of morainic-loop topography at Varna and of an exceptionally well developed moraine at Tully associated with an outwash plain, the latter dotted with pit lakes. The state park, Clark Reservation, near Jamesville, is visited and the fossil Niagara with its plunge pool, Jamesville Lake, is studied. Here drainage from part of the Great Lakes and the ice front, during the Glacial Period, followed a course to the Hudson River. Further observations will be made of the Onondaga Escarpment, and drumlins at Syracuse. The return trip will be made by way of Skaneateles Lake. July 26.

#### GERMAN

S 1. **First Year German.** Grammar, composition, reading, oral training. Daily except Sat., 8 and 12. GS 183. Assistant Professor ANDREWS. Credit four hours. Entrance credit, one unit.

After successfully completing this course, students can, by supplementary reading during the summer, prepare themselves for the College Board entrance examination in second year German.

S 3. **Third Year German.** Reading, grammar, composition, oral training. Daily except Sat., 8 and 12. GS 190. Professor FAUST. Credit four hours. Entrance credit, one unit (third unit).

Prerequisite: two years of high school German or its equivalent.

S 4. **Composition and Conversation.** Credit two hours. Daily except Sat., 8. GS 164. Dr. SPANN.

Exercises conducted in German. Prerequisite course S 3 or its equivalent.

S 5. **Rapid Reading.** Credit two hours. Daily except Sat., 9. GS 183. Assistant Professor ANDREWS.

German texts of literary value will be read and translated, with casual comment upon their literary significance.

Prerequisite: three years of high school German or the equivalent.

**S 6. German Fiction of the 20th Century.** Credit two hours. Daily except Sat., 9. GS 190. Dr. SPANN.

Beginning with the period of impressionism (symbolism) at the close of the nineteenth century, and extending to the fiction of the present day. Lectures in German. Collateral reading.

**S 7. German Drama of the 19th Century.** Credit two hours. Daily except Sat., 10. GS 190. Professor FAUST.

Lectures in German. Interpretations of selected dramas of Tieck, Werner, Kleist, Grillparzer, Hebbel, Ludwig, Anzengruber, Hauptmann.

**German Lectures.** Lectures or interpretative readings in German will be given by members of the department on Wednesday evenings at 8 o'clock in GS 190.

**German Conversation.** A special table for conversation in German will be reserved in Prudence Risley Hall or Sage College in case a sufficient number of applications are received by the Department of German, Goldwin Smith Hall 181, before July 1.

## GOVERNMENT

**S 1. American National Government.** Credit two hours. Daily except Sat., 9. GS 245. Professor CUSHMAN.

Historical development, organization, powers, and practical working of the American National Government.

**S 28. American Constitutional Government.** Credit two hours. Daily except Sat., 11. GS 245. Professor CUSHMAN.

A survey of the development of the Federal Constitution. Lectures, readings, a study of Supreme Court decisions, class discussions. Each student will be expected to prepare a report upon a chosen topic. Open to those who have had a general course in American Government.

## GREEK

**S 1. Introduction to Greek and to the Reading of Homer.** This course is intended (a) for graduate students who have had no Greek; (b) for high-school teachers of Latin who have had no direct acquaintance with Greek and are therefore deprived of one of the chief sources of understanding and appreciating the content of the Latin authors they present in class; (c) for students of literature who desire by intensive work during a Summer Session to lay the foundation for a first-hand appreciation of the literary masterpieces of the Greek genius. Beginning with the alphabet, the course will give a thorough grounding in necessary forms, flexions, and syntax, and will proceed to the reading of a portion of the first book of Homer's Iliad. Credit two hours. Daily except Sat., 11. GS 124. Assistant Professor CAPLAN.

**S 2. Homer.** This course is designed for students who have mastered the elements of Greek and wish to enlarge their knowledge of Homer. Rapid reading in the Odyssey. Credit two hours. Daily except Sat., 10. GS 124. Assistant Professor CAPLAN.

## HEALTH EDUCATION

See under Physical and Health Education, page 44.

## HISTORY

**S 1. Imperial Rome (133 B. C. to 330 A. D.).** Credit two hours. Daily except Sat., 9. GS 234. Professor LAISTNER.

This course will (1) trace the growth of Rome as an imperial power, (2) offer a general survey of the political, social, and economic condition of Rome, Italy, and the Provinces during the first three centuries A. D.

**S 2. The Intellectual History of Western Europe during the Early Middle Ages.** Credit two hours. Daily except Sat., 10. GS 234. Professor LAISTNER.

This course will deal with the chief intellectual activities and writings during the so-called Dark Ages and the Carolingian Revival, and will estimate the debt of the early Middle Ages to the literature and thought of Greece and Rome. Students desiring to attend this course must first obtain the permission of the instructor.

**S 5. Modern European History.** Credit two hours. Daily except Sat., 10. *GS 242.* Associate Professor ANDREWS.

A general survey of the history of Europe from 1870 to 1914.

**S 6. The French Revolution.** Credit two hours. Daily except Sat., 11. *GS 242.* Associate Professor ANDREWS.

A study of the period from 1789 to 1795 with a sketch of conditions before the Revolution.

**S 7. English History from 1660.** Credit two hours. Daily except Sat., 8. *GS 221.* Assistant Professor MARCHAM.

Political, economic, and social life. Readings in contemporary literature. Primarily for sophomores and juniors.

**S 8. Tudor and Early Stuart England.** Credit two hours. Daily except Sat., 9. *GS 221.* Assistant Professor MARCHAM.

Politics, the Reformation and Renaissance, the economic revolution. Readings in contemporary literature. Primarily for seniors and graduates.

**S 10. The United States, 1865-1900.** Credit two hours. Daily except Sat., 9. *GS 290.* Professor LINGLEY.

The main currents in American political, economic, social, and diplomatic history from Reconstruction to the War with Spain. Civil service, government regulation of industry, tariff and finance as political issues. Lectures, discussions, readings. For undergraduates.

**S 11. American Political Biography, 1783-1865.** Credit two hours. Daily except Sat., 11. *GS 234.* Professor LINGLEY.

A critical evaluation of biography, autobiography, and reminiscence in the study of American history. Lectures, reading of typical biographies, individual studies of source problems. For upper classmen and graduates.

**S 12. American History, the Middle Period, 1815-1850.** Credit two hours. Daily except Sat., 8. *GS 234.* Professor BRETZ.

A survey of the period with special reference to political theory, the development of nationality, territorial expansion, and the crisis of 1849-1850. The course is intended for undergraduates.

**S 13. Seminary in American History.** Credit two hours. Daily except Sat., 10. *GS 235.* Professor BRETZ.

Chiefly for students who are preparing theses for the M. A. degree. Consult the instructor before registering.

**S 17. Contemporary History and its teaching in the secondary schools.** Credit two hours. Daily except Sat., 12. *GS 277.* Mr. KIDGER.

The history of Europe since the war: the Peace Treaty; the conferences of the premiers and of the ambassadors; the League of Nations; England; France; Italy; Germany; Austria; Hungary; Czechoslovakia; Jugoslavia; and Poland. Both in method and in content the course will be useful to teachers in secondary schools especially such as teach the courses in world history prescribed by the new syllabus of the University of the State of New York.

**S 30. Teachers' Course in Social Studies.** See Education, page 29.

## LATIN

The object of the Summer Session courses in Latin is twofold:

(a) To provide a series of courses, theoretical and practical, dealing with the professional training and equipment of the high-school Latin teacher who desires a thorough comprehension of the aims and of the technique of the recent developments in classical teaching in the secondary schools;

(b) To offer advanced courses, with direction of graduate work for those who are qualified to enter the Graduate School or to continue their work as candidates for the degree of Master of Arts with Latin as a major or a minor subject.

The attention of all Latin students is directed to the courses in Greek. See page 38.

**S 1. The Training of Latin Teachers and the Technique of Instruction in the Preparatory Years.** Lectures, discussions, and conferences. The objectives in secondary Latin instruction; standards and means of determination of progress, and the validity of various types of test in indicating measure of success in instruction. A study of works (in addition to those of Caesar, Cicero, and Virgil) appropriate and available for the secondary school. A detailed discussion of the forms and flexions studied in preparatory Latin, and of the more important syntactical usages of Latin. The classical element in the English language with a consideration of the chief etymological principles involved; English 'derivatives' in secondary instruction. Credit two hours. Daily except Sat., 9. GS 128. Professor DURHAM.

The subject matter of this course is similar to that of the corresponding course offered in The Summer Session of 1929, but the method of treatment and the distribution of emphasis on the various subdivisions will be different.

The credit of two hours carried by this course is countable toward the group of six semester hours in General and Special Methods required by the New York State Department of Education as part of the prerequisite for the Professional Certificate for high school teaching. Similar credit in an elective group will be recognized by the State of Pennsylvania. Students from states where other requirements for teachers' certificates are in force are advised to secure in advance from their own school authorities an indication that this course will be counted towards the satisfaction of their particular professional requirements.

**S 2. Virgil.** A study of the *Aeneid*, particularly of the second half, and of the *Eclogues* and the *Georgics*. In view of the Bimillennium of Virgil special attention will be paid to Virgil's place in literature and to his influence upon later ages. Primarily for graduate students in Latin. Credit two hours. Daily except Sat., 12. GS 120. Professor CHASE.

**S 3. Vulgar Latin.** Introductory lectures on phonetics and pronunciation, followed by a detailed consideration of the characteristics of Latin as a spoken language in classical and later times. Reading of representative texts and interpretation of inscriptions.

Primarily for graduate students. Credit two hours. Daily except Sat., 10. GS 128. Professor DURHAM.

**S 4. Roman Elegiac Poetry.** The major part of this course will be devoted to the study and interpretation of Tibullus and Propertius. Primarily for graduate students in Latin. Credit two hours. Daily except Sat., 11. GS 120. Professor CHASE.

**NOTE:** Those who wish to begin their candidacy for the degree of Master of Arts are invited to correspond in advance with Professor Durham, and are requested to bring with them at the opening of the Summer Session such credentials of undergraduate work leading to the degree A.B. as will entitle them to admission to the Graduate School.

## MATHEMATICS

Each teacher will have a daily office hour for consultation with students. It is urged that this opportunity be utilized by all concerned.

In the following list, courses S 1 to S 5b are the equivalent of courses having the same numbers in the *Announcement of the College of Arts and Sciences* for 1929-30.

Courses S 1, S 2, S 3, are planned for those teachers in the secondary schools who wish to review these subjects. They are equivalent to the advanced entrance requirements of Cornell University and of the College Entrance Examination Board. They presuppose a ready knowledge of elementary and intermediate algebra and of plane geometry. University credit for S 1, S 2, S 3, three hours each.

Students taking S 5a or S 5b are requested to take no other University work during the session without special permission. University credit for S 5a, S 5b, five hours each.



S 1. **Solid Geometry.** Daily, 10. *White 27.* Mr. HADLOCK. (Office hour, 9, *White 29.*) *White 21.* Mr. LOWENSTEIN. (Office hour, 9, *White 23.*)

S 2. **Advanced Algebra.** Daily, 9. *White 6.* Professor HURWITZ. (Office hour, 10, *White 8.*) *White 10.* Professor CARVER. (Office hour, 10, *White 12.*)

S 3. **Trigonometry.** Daily, 8. *White 10.* Professor CARVER. (Office hour, 10, *White 12.*) *White 24.* Mr. LAWRENCE. (Office hour, 9, *White 23.*)

S 5a. **Analytic Geometry and the Calculus** (First term's work). Daily, 8 and 11. *White 2.* Assistant Professor BAMFORTH. (Office hour, 9, *White 4.*)

S 5b. **Analytic Geometry and the Calculus** (Second term's work). Daily, 8 and 11. *White 5.* Assistant Professor CRAIG. (Office hour, 9, *White 4.*) *White 21.* Mr. AGNEW. (Office hour, 9, *White 23.*) *White 6.* Mr. DYE. (Office hour, 9, *White 8.*)

S 20. **Teacher's Course.** Credit two hours. Daily except Sat., 11. *White 24.* Professor SNYDER. (Office hour, 9, *White 26.*)

The course will comprise selected topics in the subjects of secondary school mathematics, including constructions by ruler and compass and the solution of problems will be emphasized.

#### ADVANCED COURSES

S 23. **Modern Higher Algebra.** Credit three hours. Daily, 9. *White 25.* Professor HUTCHINSON. (Office hour, 10, *White 26.*)

Theory of determinants, matrices, linear equations, linear dependence, linear transformations, quadratic forms. Text-book: Bôcher, *Introduction to Higher Algebra.*

S 42. **Advanced Calculus.** Credit three hours. Daily, 8. *White 1.* Professor GILLESPIE. (Office hour, 9, *White 3.*)

A study of the processes of the calculus; definitions and properties of limits, continuity, derivatives, and integrals.

S 45. **Functions of a Complex Variable.** Credit three hours. Daily, 12. *White 6.* Professor HURWITZ. (Office hour, 10, *White 8.*) Prerequisite Mathematics 4b or the equivalent.

An introductory course on single-valued analytic functions, chiefly from the standpoint of Cauchy and Riemann.

S 61a. **Projective Geometry.** Credit three hours. Daily, 10. *White 28.* Professor SHARPE. (Office hour, 10, *White 26.*)

The principles underlying projective forms of the first degree will be discussed. Although no knowledge of mathematics beyond plane geometry will be presupposed, additional training is highly desirable.

S 61b. **Advanced Projective Geometry.** Credit three hours. Daily, 10. *White 24.* Professor SNYDER. (Office hour, 10, *White 26.*)

Continuation of S 61a. Problems of the second degree, in two and three dimensions will be discussed synthetically.

#### READING AND RESEARCH COURSES

In addition to the preceding courses, opportunities are offered to graduate students to participate in informal work by reading and research under the direction of members of the Department of Mathematics. A regularly registered student may, by arrangement, obtain academic credit for any of this work; the number of hours of credit will depend on the amount of work done. Students interested in such directed reading or research may consult any of the following: Professors HUTCHINSON, SNYDER, SHARPE, HURWITZ, CARVER, GILLESPIE; Assistant Professors CRAIG, BAMFORTH.

S 100. **Topics in Algebra.**

S 100. **Topics in Analysis.**

S 100. **Topics in Geometry.**

S 100. **Topics in Applied Mathematics.**

## MUSIC

**S 3. Dalcroze Eurhythmics.** Credit two hours. Daily except Sat., Section 1, for women, 8; section 2, for men, 11; sections 3 and 4, for children, 9 and 10. ———. Miss REUSCHEL.

A course in the expression of music through bodily action, dealing with rhythm, dynamics, mood, and other elements of content. Students registered in section 1 or 2 will be required to observe a certain amount of the work of the children's sections, at the scheduled hours or other hours to be arranged. Except for open periods to be announced, no auditors or visitors will be allowed. A special fee of ten dollars is charged for this course.

**S 10. Harmony.** Credit two hours. Daily except Sat., 9. *Music Building, 320 Wait Avenue.* Professor WEAVER.

A course dealing with the construction and interconnection of triads and chords of the seventh.

**S 17A. The Art of Music.** Credit two hours. Daily except Sat., 10. *Music Building, 320 Wait Avenue.* Professor WEAVER.

The fundamental acoustic, psychological, theoretical, aesthetic, and historical factors which enter into a rational understanding and enjoyment of the art.

**S 21B. History of Music.** Credit two hours. Daily except Sat., 8. *Music Building, 320 Wait Avenue.* Dean VARDELL.

A course dealing with the historical development of music from the time of Bach to the present.

**S 30. Music in the Grade Schools.** Credit two hours. Daily except Sat., 11. *Music Building, 320 Wait Ave.* Mr. PERCIVAL.

An introduction to the general problem of school music; its values as an educational subject; principles underlying classroom methods; examination of materials and practical suggestions for teachers of grades 1 to 6.

**S 31. Music in the Junior High School.** Credit two hours. Daily except Sat., 12. *Music Building, 320 Wait Ave.* Mr. PERCIVAL.

A study of the particular problems of the Junior High School and the place of music in that school; evaluation of methods and materials and practical suggestions for teachers.

**S 32. Music in the Senior High School.** Credit two hours. Daily except Sat., 2. *Music Building, 320 Wait Ave.* Mr. SPOUSE.

A study of the particular problems of the Senior High School and of the types of musical instruction suitable to and desirable in that school; evaluation of methods and materials and practical suggestions for teachers.

**S 35. Voice Culture.** Credit two hours. Daily except Sat., 3. *Music Building, 320 Wait Ave.* Mr. SPOUSE.

A course dealing with the theory and practise of vocal production as applied to speaking and singing, with special attention to methods of presentation to groups rather than to the individual.

**Chorus.** The Department of Music will organize and maintain a choir for the services in Sage Chapel at 11 o'clock each Sunday morning during the Summer Session. Applications for admission to this choir will be received by Dean VARDELL in Sage Chapel on Wednesday, July 9, from 3:30 to 5 o'clock, or on Thursday, July 10, from 4 to 5 o'clock. The rehearsals will be held on Thursdays at 5 o'clock and on Sundays at 10. All students desiring to sing are urged to become members of this choir.

## PHILOSOPHY

**S 1. Logic.** Credit two hours. Daily except Sat., 9. *GS 227.* Assistant Professor FISCH.

The general character of the thinking process, its laws of development and methods of solving problems.

**S 2. Ethics.** Credit two hours. Daily except Sat., 11. *GS 227.* Assistant Professor FISCH.

A survey of moral problems and of the major theories of right and wrong.

**S 3. History of Ancient Philosophy.** Credit two hours. Daily except Sat., 8. *GS 225.* Assistant Professor SMART.

A survey of the chief Greek and Roman systems of philosophy and their survival in the Christian civilization of the Middle Ages.

**S 4. History of Modern Philosophy.** Credit two hours. Daily except Sat., 11. *GS 225.* Professor WIDGERY.

The main currents of modern philosophy with special reference to Descartes, Spinoza, Leibniz, Hume, Kant, Hegel, the English Neo-Hegelians, and contemporary realism.

**S 5. American Philosophy.** Credit two hours. Daily except Sat., 10. *GS 227.* Assistant Professor SMART.

A study of American thought from its colonial beginnings to the present, with special reference to the theories of Royce, James, Dewey, Santayana, and Whitehead.

**S 6. Modern Ethical Theories.** Credit two hours. Daily except Sat., 9. *GS 225.* Professor WIDGERY.

A critical study of the chief ethical theories during the last fifty years in Europe and America. For seniors and graduates; others admitted only by special permission.

## PHYSICAL AND HEALTH EDUCATION

The following courses are designed primarily for teachers and supervisors of physical education in public schools, and for students who wish to supplement the preparation they may have received in colleges or professional schools. The courses are also open to other students and to teachers who may wish to take either the theory or practice courses or both, and whose application has been approved by the Chairman of the Summer Session.

**S 1. History—How Men Have Lived.** Credit two hours. Daily except Sat., 8. *GS 134.* Professor YOUNG.

An historical survey of the distinguishing characteristics of various peoples as to habits of living and forms of physical activity, and the part these have played in their national development.

**S 2. Organization and Administration of Play, Athletics, and Gymnastics.** Credit two hours. Daily except Sat. 9. *GS 134.* Professor YOUNG and Mr. CHAMBERLAIN.

The social and educational values of play, with special emphasis upon the management and supervision of high school athletics, recreation centers, scouting, and camp activities.

**S 3. Theory of Physical Education and Methods of Teaching.** Credit two hours. Daily except Sat., 11. *GS 134.* Mr. CHAMBERLAIN.

The object and scope of physical education; the principles and technique involved in its teaching; arrangement, classification, and progression of exercises.

**S 4. Physical Measurements and Tests.** Credit two hours. Daily except Sat., 10. *GS 134.* Professor YOUNG and Mr. CHAMBERLAIN.

A survey of work in the field of measurements; tests of physical ability and proficiency as applied to elementary and high schools.

**S 7. Physiology of Exercise.** Credit one hour. M W F, 12. *Stimson.* Dr. GOULD.

The nature and importance of the processes taking place in the body during muscular exercise; effects of exercise upon the heart and blood vessels; the co-ordination of the circulation and respiration; the after-effects of exercise.

**S 8. Kinesiology and Corrective Exercises.** Credit two hours. Daily except Sat., 11. *Stimson.* Dr. GOULD.

This course deals with the principles and mechanisms of bodily movements. The mechanism of representative types of exercise is studied for the purpose of determining as far as possible their effect upon health. Exercises for the correction of functional bodily deformities are studied.

**S 9. Human Anatomy.** Credit three hours. Daily except Sat., 8-10. *Stimson.* Dr. GOULD.

A course in the gross anatomy of the body presenting a general knowledge of the relations of the bones, muscles, nerves, and blood vessels. The viscera of the body will be considered in connection with the systems of which they are a part.

The course will consist of lectures and demonstrations with the dissected cadaver, anatomical charts, models, and museum preparations.

**S 11. High School Athletics (Men).** Daily except Sat., 2-4. *GS 134.* Mr. CHAMBERLAIN.

The high school attitude toward athletics as a part of the school curriculum; the present day tendencies in the various states; with emphasis upon methods of handling high school boys and upon training for leadership. The second hour will be devoted to practical work in the fundamentals of football and basketball, with tactics of offense and defense. The course is intended primarily not to train for professional coaching, but to supply information, material, and practice to those who may be called upon to coach in connection with their other teaching.

**S 12. Swedish and Danish Gymnastics,** with tactics. (Women.) Daily except Sat. 12. *Sage Gymnasium.* Miss BATEMAN.

**S 13. High School and College Athletics (Women).** Daily except Sat., 5. *Women's Athletic Field.* Miss BATEMAN.

Practical coaching in track, hockey, basketball, and archery. Instruction will be given only in those sports for which there is the largest registration.

**S 14. Folk Dancing.** Daily except Sat., 3. *Sage Gymnasium.* Miss BATEMAN.

**S 15. Dancing.** Daily except Sat., 4. *Sage Gymnasium.* Miss BATEMAN. Aesthetic and interpretative dancing and technique.

**S 16. Swimming.** For women. *Sage Gymnasium, 9-12 A. M., 2:30-5 P. M.* Miss RYAN.

Instruction in swimming and life saving for individual training and for teaching will be given at hours to be arranged with each applicant by appointment. For this instruction a special charge of ten dollars is made.

**S 18. Tennis.** For men and women. 9-12:30, 2-5, *Risley Courts.* Mr. MURRAY.

Instruction in the fundamentals of tennis, either individually or by pairs. For a series of ten lessons a special charge of ten dollars is made.

#### HEALTH EDUCATION

**S 1. Hygiene of the School Child and Adolescent.** Credit two hours. Daily except Sat., 8. *Stimson.* Dr. SMILEY.

In this course an attempt will be made to present the principles of personal hygiene as they apply to the health instruction and health maintenance of the child or adolescent in his school life. Prerequisites suggested, General Biology and Human Physiology.

**S 2. Health Inspection of School Children.** Credit two hours. Daily except Sat., 10. *Stimson.* Dr. YORK.

A practical course of lectures and demonstrations designed to familiarize the student with the facts and methods necessary for making an effective health inspection of school children. Prerequisites suggested but not demanded, Human Physiology, Human Anatomy.

**S 3. First Aid and Safety First.** Credit one hour. M W F, 11. *Stimson.* Dr. YORK.

This course will include a discussion and practical demonstration of the main methods at hand for preventing accidents and for giving emergency treatment.

**S 4. Teachers' Course.** Credit two hours. Daily except Sat., 9. *Stimson.* Dr. SMILEY.

Lectures and discussions on the methods and materials for the teaching of personal and community hygiene in the elementary and secondary schools.

University credit will be given in the courses as indicated, subject, however, to the rules and regulations of the college in which a degree is sought.

The following subjects, which are required for the New York State Teacher's Certificate in Physical Education, and for which regular University credit is given, are offered in the Summer Session: Education, English, Foreign Language, Chemistry, Physiology, History, Biology, Psychology, Educational Psychology, Zoology, Economics.

### PHOTOGRAPHY

**S 1. Photography.** Credit two hours. Demonstration lectures and laboratory work. Daily except Sat., 2-4. *Rockefeller*. Instructor to be detailed by the Eastman Kodak Company.

This course is planned for vocational teachers, high school and grade teachers interested in the instruction of hobby clubs, and others interested in photography. The work includes developing, printing and mounting, a study of the technique of picture-taking, setting, light and shade, outdoor and indoor practice, etc. Laboratory fee, \$10.

### PHYSICS

**Demonstration Lectures.** A series of experimental demonstrations covering the entire field of Physics. Little time will be spent on the development of the related theory, this being left for the classroom work of the course described below. Teachers may find in these demonstrations valuable suggestions for their own work. These lectures are a required part of course S 6. Daily, 8. *Rockefeller* A. Assistant Professor HOWE.

**S 6. Introductory Experimental Physics.** Credit six hours. Demonstration lectures, recitations, and laboratory work. Lectures, daily, 8. *Rockefeller* A. Recitations, daily, 9; quiz, M, 10-12. *Rockefeller* 107. Assistant Professor HOWE. Laboratory, three two-hour periods a week. Section A, T W, 10-12 and F, 2-4; Section B, Th F, 10-12 and T, 2-4. *Rockefeller* 220. Mr. ZELLER. Fee, \$5. This course is the substantial equivalent of courses 3 and 4 and of course 6 as given in the regular session.

Teachers of secondary school physics may, with the approval of the professors concerned, substitute the work of course S 90 for the recitations of S 6.

**S 29. General Physics.** Credit two hours. Theory and problems covering selected topics in magnetism and electricity. It is recommended that Physics S 34 be taken simultaneously with Physics S 29. Prerequisite Physics 6, or its equivalent, and calculus. Recitations, daily except Sat., 11. *Rockefeller* 106. Assistant Professor GRANTHAM.

**S 34. Physical Measurements.** Credit two hours. Three three-hour laboratory periods a week. Prerequisite Physics 6 and Mathematics 5a and 5b. Physical measurements in properties of matter, mechanics, heat, light, magnetism, and electricity. Required of candidates for M.E. and E.E. Laboratory open daily except Sat., 1:40-4. *Rockefeller* 252. Assistant Professor GRANTHAM. Fee, \$5.

**S 60. Physical Experiments.** Credit one to three hours. Prerequisite Physics 3 and 4, or Physics 6 and Mathematics 3. Laboratory work in mechanics, properties of matter, heat, sound, light, electricity. Physical principles will be emphasized for students of less experience, while for those of more experience either in physics or mathematics opportunity will be given to study methods of measurements, sources of error, the adjustment and use of instruments of precision, and graphical methods of interpreting results. The instruction is individual and will be adjusted to meet the needs of each student. Laboratory open daily except Sat., 1:40-4. *Rockefeller* 252. Assistant Professor COLLINS. Fee, \$2.50 a credit hour.

**S 90. Teachers' Course.** Credit two hours. Lectures, discussions, and conferences, with emphasis upon the selection, organization, and presentation of subject-matter and practice in the care and manipulation of apparatus in classroom and laboratory. Daily except Sat., 9. *Rockefeller* 108. Mr. ZELLER.

Conferences, individual or by groups, may be arranged for the discussion of practical problems suggested by members of the class. Teachers are advised to bring with them a copy of the textbook which they are using.

Teachers of secondary school physics may, with the approval of the professors concerned, combine this course with S 6, which see.

**S 106. Advanced Laboratory Practice.** Open to students who have had Physics S 60 or its equivalent. Credit varies with the amount of work done. The laboratory is open daily except Sat., 9-12. *Rockefeller* 301. Dr. SMITH. Fee, \$2.50 a credit hour.

This course is intended to meet the requirements of the following classes of students: (1) those wishing to take up special topics for detailed study; (2) those taking Course S 111 or S 130 and desiring to supplement that work in the laboratory; (3) those who wish to develop their laboratory technique in preparation for research.

[The sequence of courses S 111 to S 140 is intended to run through three summer sessions. The schedule for the next three summers is: 1930, S 130 and S 111; 1931, S 121 and S 112; 1932, S 122 and S 140. The courses are of the same general character as the corresponding courses given in the fall and spring terms but include somewhat fewer topics. The selection of these topics will be influenced by the interests and needs of the class. To profit by these courses a student should have a knowledge of calculus and should have completed courses in general physics covering the principal topics of the subject. A student who contemplates electing any of these courses is advised to correspond with the department about his preparation for the work. These courses, as also S 106, S 400, S 415, and S 500, may be taken for credit toward an advanced degree in Physics, subject to the requirements of the graduate school. See the *Announcement of the Graduate School*.]

**S 111. Mechanics.** Credit two hours. An introductory study of analytical mechanics and terrestrial and universal gravitation based upon Jean's *Theoretical Mechanics*. Daily except Sat., 8. *Rockefeller* 103. Professor GIBBS.

[S 112. **Properties of Matter.** The analysis of stresses and strains and some applications; surface tension; the motion of fluids and the effects of viscosity.] Not given in 1930.

[S 121. **Electricity and Magnetism.** Electrostatic and magnetic fields, direct current phenomena; gaseous, electrolytic, and metallic conduction; chemical and thermal electromotive forces.] Not given in 1930.

[S 122. **Electricity and Magnetism.** Electromagnetism, variable current phenomena, and electric oscillations. Starling's *Electricity and Magnetism* will be used as a text.] Not given in 1930.

**S 130. Light.** Geometrical optics; thick lenses; optical instruments. Physical optics: interference, diffraction, polarization. Houston's *Treatise on Light* will be used as a text. Daily except Sat., 9. *Rockefeller* C. Assistant Professor COLLINS.

[S 140. **Heat.** A general discussion based upon Poynting and Thompson's *A Text-Book of Physics*. Heat, with particular attention to the application of the kinetic theory and thermodynamics.] Not given in 1930.

**S 400. Wave Mechanics and Band Spectra.** Credit two hours. Prerequisite a thorough general course in physics and calculus. Daily except Sat., 12. *Rockefeller* C. Professor KEMBLE.

The Schrödinger differential equation and the energy level problem. The hydrogen atom. The emission of radiation and the principles of selection. The structure of band spectra. The wave mechanics and the "dumb-bell" model. Perturbation theory. The resonance phenomenon and the problem of helium. Electron spin and the Pauli exclusion principle. The theory of the hydrogen molecule. Classification of electronic states of diatomic molecules.

**S 415. Special Topics for Investigation.** Students who are prepared to profit by the use of the library and laboratory facilities of the department in the study of some special topic or in investigation will be given an opportunity to do so. This work may be taken in connection with or independently of any of the above courses and will be under the direction of one or more members of the staff, with whom frequent conferences should be arranged. Credit varies with the nature and amount of work done.

For further information regarding opportunities for research and investigation during the summer see the *Announcement of the Graduate School*.

**S 500. Selected Topics.** Two or three meetings each week at hours to be arranged. Professor KEMBLE.

A discussion of topics in quantum mechanics, such as the interaction of matter and radiation, the quantum theory of the electro-magnetic field, and the transformation theory formulation of the fundamental principles of quantum mechanics. The final selection of topics will be determined after consultation with the class.

**Seminary.** Reports and discussions of recent work in Physics. M, 2:30. *Rockefeller C.*

## PHYSIOLOGY AND BIOCHEMISTRY

**S 50. The Conditioned Reflex.** Methods and results in the study of the conditioned reflex. Credit two hours. T Th, 2-4. *Stimson 29.* Assistant Professor LIDDELL.

## PSYCHOLOGY

**S 1. Psychology.** Credit two hours. Lectures and recitations, daily except Sat., 9. *GS C.* Professor WELD and Dr. FELDMAN.

This course furnishes a general introduction to the study of the normal human mind from the experimental point of view. It opens with a brief discussion of the nature of psychology, of the problems which psychology is called upon to face, and of the methods at its disposal for their solution. It then sets forth in order the facts and laws of mental life. Throughout the work use will be made of the unique collection of demonstrational apparatus which composes the equipment of a special laboratory in Goldwin Smith Hall.

Textbook: Bentley, *The Field of Psychology*.

**S 2. Attention.** Credit two hours. Daily except Sat., 10. *GS C.* Assistant Professor JENKINS.

In this course the application of attention to advertising, to hypnosis, to testimony, to efficiency, and to learning, will receive special emphasis. The application will, however, be made only after the student has been grounded in the elementary facts and laws of attention. The development, the conditions, the kinds, and the levels of attention will first be considered; then the experimental investigations will be reviewed; and thereafter the practical considerations will be taken up.

Demonstrations and class-experiments will be used frequently for illustration. No textbook will be prescribed, but the lectures will be supplemented by assigned readings in standard works.

**S 3. How to Study.** Credit two hours. Daily except Sat., 8. *GS C.* Assistant Professor JENKINS.

The facts and principles of experimental psychology applied to the problem of efficiency in study. Securing effective surroundings; using one's psychological resources; discovering motives for study.

Demonstrations and class-experiments will be made throughout the course. Readings will be assigned in standard texts and monographs to be found in the library.

**S 6. Psychology and its Neighbors.** Credit two hours. Lectures and recitations, daily except Sat., 10. *Morrill 42.* Professor BENTLEY and Dr. FELDMAN.

The place of man in the universe and among other animals. Origin and history of man and of human society. The study of living beings by the zoologist, the physiologist, the anthropologist, and the psychologist. The psychologist's way of describing human beings. The psychological functions. The development and socialization of the human infant.

Textbook: Bentley, *Man*.

**S 7. Varieties and Schools of Psychology.** Credit two hours. Lectures and recitations, daily except Sat., 11. *Morrill 41.* Professor BENTLEY.

An exposition of the current schools of psychology. The historical derivation of present doctrines and points of view. The significance of Behaviorism, Psychoanalysis, Configurationism, Reflexology, and other recent proposals. Fundamental knowledge of psychology will greatly aid the student in this course.

**S 8. General Psychology: Problems and Points of View.** Credit two hours. Lectures and recitations, daily except Sat., 11. *GS C.* Professor WELD.

This course presupposes S 1 or its equivalent. It presents a survey of the problems and points of view in the entire field of scientific psychology. Beginning with an investigation of typical conceptions of general psychology, the course leads on to the psychology of individual differences, the psychology of the abnormal, animal psychology, psychological development in the race and in the individual, social psychology, and the psycho-technologies.

Textbook: Weld, *Psychology as Science*.

**S 9. Graduate Seminary.** Daily, by appointment. *Psychological Laboratory, Morrill Hall.* Professor BENTLEY.

Individual researches and informal study.

## PUBLIC SPEAKING

### ORAL ENGLISH: SPEECH TRAINING: DRAMATIC ART

All summer courses are planned to meet the special needs of teachers. Either S 3 or S 9 (not both) may be counted as a course in methods approved by the New York State Department of Education for the teachers' certificate.

Students should register with the individual instructors, who will be in their offices on registration day and on the first day of instruction. For further details about registration consult Assistant Professor MUCHMORE, *GS 27*.

For information about advanced work in Speech Training and Phonetics consult Mr. MUCHMORE; in Rhetoric and Public Speaking, Mr. WICHELS, *GS 25*; in Dramatic Production, Mr. STANTON, *GS 33*.

**S 1. Public Speaking.** Credit two hours. Daily except Sat., 11. *GS 21.* Assistant Professor WAGNER.

A practical training for speaking in public. Study of delivery, of methods of preparation, and of rhetorical forms, with practice in delivery. High-school teachers will find the methods applicable to their work in public speaking and oral English. Regular students passing S 1 are admitted to Public Speaking 2.

**S 3. Teachers' Course in Oral English and Public Speaking.** Credit two hours. Daily except Sat., 11. *GS 236.* Assistant Professor MUCHMORE.

For secondary school teachers of English and public speaking. Aims, problems, standards, and methods in oral English, public speaking, and speech training.

**S 8. Voice Training.** Credit one hour. Daily except Sat., 9. *GS 21.* Mr. THOMAS.

An elementary course for the improvement of the speaking voice, including instruction in the fundamental principles of voice and speech.

**S 10. Oral Interpretation of Literature.** Credit two hours. Two sections: daily except Sat., 10, *GS 236*, Assistant Professor MUCHMORE; daily except Sat., 12. *GS 236.* Assistant Professor WAGNER.

Principles of reading, and oral interpretation of literature.

**S 21. Rhetorical Theory.** Credit two hours. Daily except Sat., 9. *GS 236.* Assistant Professor WICHELS.

For graduates and upperclassmen. Lectures, readings, reports, and discussions.

A study of classical works on the art of public speaking, with illustrations from the orators.

**S 31. Teachers' Course in Speech Training.** Credit two hours. Daily except Sat., 12. *GS 26.* Mr. THOMAS.

For secondary and elementary school teachers. A study of English phonetics, pronunciation, voice-training, the improvement of speech, and the principles of oral expression.



**S 41. Dramatic Production.** Credit two hours. Daily except Sat., 11. GS B. Assistant Professor HERRICK.

Theory of stage direction; choice of plays; practical phases of production; one-act plays rehearsed; practice with the Summer Theatre. Students in S 41 should take S 10 or offer its equivalent.

**S 45. Stagecraft.** Credit two hours. Daily except Sat., 10, with additional laboratory hours to be arranged. Stage laboratory. *Morse Hall*. Assistant Professor STANTON.

An elementary course in stage theory and practice; the planning of small theatres; design and construction of scenery; lighting; with attention to other contributory crafts and to the related principles of stage direction. Laboratory fee, \$5.

**S 60. Seminary in Rhetorical Theory.** Hours to be arranged. Assistant Professor WICHELS.

For graduates. The topic in 1930 will be English and American theories from 1500 to the present.

**S 63. Principles of Voice Training and Speech Correction.** Credit two hours. Hours to be arranged. Assistant Professor MUCHMORE.

For graduates and other students having sufficient preparation for independent work. Readings in the sciences underlying voice-training and speech-correction, with a critical survey of theories and methods.

**S 66. Seminary in Dramatic Art.** Credit two hours. T Th, 2-4, and an additional hour to be arranged. GS 21. Assistant Professor HERRICK.

For graduates prepared for advanced work in the theory of dramatic production. Readings, reports, and lectures.

**S 90. Theatre Practice.** No credit; a certificate of attendance will be given for satisfactory completion of the routine. Hours to be arranged. Assistant Professor STANTON, assisted by the Summer Theatre Staff.

Open to undergraduates and graduates who are taking or have taken one or more of the courses in Dramatic Production, and to other qualified persons by consent of the instructor. Practical stage-management in the Summer Theatre supplementing the work of the courses in Dramatic Production. Registration will be taken in the several classes in Dramatic Production during the first week of the session.

**The Summer Theatre.** Under the direction of Professor DRUMMOND. Acting Director in the summer of 1930 Assistant Professor STANTON, assisted by Mr. GENUNG, Mr. HEWITT, Miss WORMAN, Mr. VOSS, and Mr. HERRICK.

During the Summer Session weekly performances will be given by the student repertory Summer Theatre Company. Qualified members of the courses in Dramatic Production may compete for places in the casts of Summer Theatre plays. For this work they will register in the regular classes in Dramatic Production during the second week of the session.

**Speech Clinic.** For students working under the supervision of the Department of Public Speaking. By appointment. GS 28. Mr. THOMAS.

## ROMANCE LANGUAGES

### FRENCH

**S 1. Elementary Course.** Credit four hours. Daily except Sat., 8 and 12. GS 290. Assistant Professor BISHOP. Entrance credit, one unit.

The object of this course is twofold: first to give beginners a thorough drill in the essentials of French pronunciation, grammar, and reading; second, to offer to teachers an opportunity of studying the methods of presentation of these subjects to beginners.

**S 2. Intermediate Course.** Credit four hours. Daily except Sat., 8 and 12. GS 283. Mr. ANDRUS.

Entrance credit, one unit. Prerequisite course S 1 or its equivalent.

**S 3. Advanced Course.** Credit four hours. Daily except Sat., 8 and 12. GS 242. Dr. PELMONT.

Entrance credit, one unit. Prerequisite S 2 or its equivalent.

**S 4. Advanced Translation.** Credit two hours. Daily except Sat., 9. GS 164. Prerequisite course S 3 or its equivalent. Assistant Professor BISHOP.

**S 5. Elementary Composition and Conversation.** Credit two hours. Daily except Sat., 11. GS 290. Prerequisite course S 3 or its equivalent. Dr. PELMONT.

**S 9. Advanced Composition and Conversation.** Credit two hours. Daily except Sat., 9. GS 283. Professor PUMPELLY.

Rapid translation from standard English texts into French; frequent theme-writing. This course is conducted in French.

**S 27. Contemporary French Literature.** Credit two hours. Daily except Sat., 10. GS 277. Professor MASON.

Lectures and discussions of special topics, with extensive outside reading and reports.

**S 23. Introduction to French Philology.** Credit two hours. Daily except Sat., 10. GS 290. Professor PUMPELLY.

[S 24. **Voltaire and His Time.** Credit two hours. Daily except Sat., 10. GS 277. Professor GUERLAC.] Not given in 1930.

Lectures, readings, and reports. Mainly for graduates.

[S 31. **Phonetics.** Credit two hours. Daily except Sat., 9. GS 283. Professor MASON.] Not given in 1930.

Lectures on the basic phonetic laws of French and English; practical exercises in phonetic transcription. This course is especially for teachers of French but is open to all students who wish to study the pronunciation of French.

**S 33. Methods of Teaching French.** Credit two hours. Daily except Sat., 9. GS 177. Professor MASON and Mr. ANDRUS.

Lectures and practical exercises on the following subjects: new-type tests, prognostic tests, achievement tests, silent reading, free composition, Dalton plan, etc. For those desiring to prepare for the written examination for the approval of oral credit of the New York State Department of Education there will be special exercises and individual conferences.

[S 35. **France of Today.** Credit two hours. Daily except Sat., 12. Professor GUERLAC.] Not given in 1930.

Lectures in French on the social, intellectual, and political life of the present.

**S 47. French Seminary.** Credit two hours. M W F, 9. *French Seminary Room, Library.* Professor MASON.

Discussion of special topics in the field of modern French literature. This course is especially for graduate students and candidates for the degree of Master of Arts.

**French Lectures.** A series of lectures in French dealing with French national life will be given by the members of the instructing staff on Wednesday evenings at 8 o'clock in *Goldwin Smith Hall*, Room 290.

**French Conversation.** In *Prudence Risley Hall* and in *Sage College* special tables are arranged under competent supervision for conversation in French.

#### SPANISH

**S 1. Course for Beginners.** Credit four hours. Daily except Sat., 8 and 12. GS 177. Mr. DEILY.

Entrance credit, one unit.

**S 2. Intermediate Course.** Credit four hours. Daily except Sat., 8 and 12. GS 281. Assistant Professor GUTIERREZ.

Entrance credit, one unit.

**S 4. Advanced Translation.** Credit two hours. Daily except Sat., 9. GS 277. Mr. DEILY.

**S 5. Composition and Conversation.** Credit two hours. Daily except Sat., 11. GS 281. Assistant Professor GUTIERREZ.

Special attention will be given to free composition. The course is conducted in Spanish.

Courses S 4 and S 5 taken together have an entrance credit value of one unit.

**S 10. Spanish Literature.** Credit two hours. Daily except Sat., 9. *GS 281.*  
Professor DALE.

Masterpieces of Spanish. Lectures, readings, class-room discussions.

**S 11. The Spanish Language.** Credit two hours. Daily except Sat., 10.  
*GS 281.* Professor DALE.

A study of the historical development of the language; philology; phonetics.

**[S 31. Spanish Composition for Teachers.** Credit two hours. Daily except  
Sat., 10. *GS 281.*

Rapid review of grammar; conversation, free composition, and phonetics. The  
course is specially designed for those who wish to prepare for the oral credit  
examination in Spanish of the State Department of Education.] Not given in  
1930.

# SUMMER SESSION OF THE LAW SCHOOL

Eleven Weeks, divided into two terms

## COURSES

*First term, June 23 to July 30*

**Contract.** Dean HILDEBRAND of the University of Texas. Eight hours a week, both terms. Credit six hours.

**Property 1a.** Professors FARNHAM and VERRALL of Cornell University. Six hours a week, both terms. Credit four hours.

**Evidence.** Professor WILSON of Cornell University. Eight hours a week. Credit three hours.

**Sales.** Professor WHITESIDE of Cornell University. Eight hours a week. Credit three hours.

**Domestic Relations.** Professor MCCURDY of Harvard University. Six hours a week. Credit two hours.

**Mortgages.** Professor ROWLEY of the University of Cincinnati. Six hours a week. Credit two hours.

**Wills.** Professor GRAY of Syracuse University. Six hours a week. Credit two hours.

*Second term, July 31 to September 5*

**Contract.** (See above)

**Property 1a.** (See above)

**Trusts.** Professor REEVE of the University of Pennsylvania. Eight hours a week. Credit three hours.

**Property II.** Professor MADDEN of the University of Pittsburgh. Eight hours a week. Credit three hours.

**International Law.** Professor ROBINSON of Cornell University. Six hours a week. Credit two hours.

**Partnership.** Professor MAGRUDER of Harvard University. Six hours a week. Credit two hours.

**Bankruptcy.** Professor HOLBROOK of the University of Michigan. Six hours a week. Credit two hours.

## SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State Summer Session at Cornell University and the Summer Session of Cornell University.

The tuition fee in the Summer School of Biology, regardless of the number of courses taken, is sixty dollars.

### STAFF OF INSTRUCTION

HOWARD BERNHARDT ADELMANN, Ph.D.	Histology and Embryology
(Professor of Histology and Embryology)	
HARRY MORTON FITZPATRICK, Ph.D.	Mycology
(Professor of Mycology)	
ALLAN CAMERON FRASER, Ph.D.	Plant Breeding
(Assistant Professor of Plant Breeding)	
WILLIAM ARTHUR HAGAN, D.V.M.	Pathology and Bacteriology
(Professor of Pathology and Bacteriology)	
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology
(Professor of Entomology)	
BENJAMIN FREEMAN KINGSBURY, Ph.D., M.D.	Histology and Embryology
(Professor of Histology and Embryology)	
JAMES EDWARD KNOTT	Plant Physiology
(Assistant Professor of Vegetable Gardening)	
RICHARD AUGUST LAUBENGAYER, B.S.	Botany
(Instructor in Botany)	
ROBERT MATHESON, Ph.D.	Entomology
(Professor of Entomology)	
LOREN CLIFFORD PETRY, Ph.D.	Botany
(Professor of Botany)	
HUGH DANIEL REED, Ph.D.	Zoology
(Professor of Zoology)	
WILLIAM CHARLES SENNING, A.B.	Zoology
(Instructor in Zoology)	
DONALD STUART WELCH, Ph.D.	Plant Pathology
(Assistant Professor of Plant Pathology)	
KARL MCKAY WIEGAND, Ph.D.	Botany
(Professor of Botany)	
CARL LOUIS WILSON, Ph.D.	Botany
(Assistant Professor of Botany)	
ALBERT HAZEN WRIGHT, Ph.D.	Zoology
(Professor of Zoology)	
BENJAMIN PERCY YOUNG, Ph.D.	Zoology
(Assistant Professor of Zoology)	

### GENERAL PLANS AND AIMS

The Summer School of Biology was organized to provide instruction of the highest grade in zoology, botany, and allied subjects. All the regular facilities of the University are at the disposal of the student, and as far as possible the staff has been restricted to teachers of professorial rank in the University. The courses are for the most part those given during the regular academic year condensed into a period of six weeks, but not abridged. The work is particularly planned to meet the needs of teachers and graduate students who wish to know, in addition to the subject matter, something of the methods and sources in teaching; but undergraduates also, if sufficiently pre-

pared, will find the courses adapted to their needs. Intensive rather than extensive work is necessarily expected of each student, as the courses are comprehensive. These courses lead toward advanced degrees, and special attention is given to graduate students pursuing research. Students interested in graduate study should, if possible, consult by letter with Professor K. M. Wiegand, representing the School of Biology, or with the professor concerned, before coming to Ithaca.

The intensive interest in Biology at Cornell University over a period of years has resulted in a wealth of laboratory material. Very extensive and in some cases unique collections of both plants and animals, and a very complete working library, are available to students prepared to make use of them. Ithaca is located in the Finger Lakes region of Central New York, noted not only for its picturesque beauty, but for its richness in biological material of both plants and animals. In this respect the University is perhaps not excelled by any other institution in the country. The collecting grounds are for the most part adjacent to the campus, and can be very readily visited. Within easy reach of the laboratories are fresh-water marshes and lakes, salt springs, marl springs, marl bogs, peat bogs, extensive ravines with numerous waterfalls, and upland woods or fields overlying either calcareous or noncalcareous sandy or heavy soils. The country shows a considerable variation in elevation, thus giving samples of several life zones. It is therefore possible to use as illustrative material those inland organisms which may be obtained most readily by teachers throughout the country for use in their own classes.

[A limited amount of change in the hours scheduled may be made by the staff at the beginning of the session to avoid conflicts. In the case of morning laboratories the student may obtain permission, at the option of the instructor, to be absent for a period to attend a lecture in some other course. The time so lost is to be made up later.]

### COURSES DEALING PRIMARILY WITH PLANTS

**S 1. General Botany.** Credit six hours. Equivalent to Botany 1. Lectures, M T W Th F, 8-9:30. Laboratory, M T W Th F, 9:30-12:30. One personal conference of thirty minutes each week, at an afternoon hour arranged in consultation with the student. Occasional field trips. The afternoons should be reserved for these trips and the conferences. *Stone.* Professor PETRY and Mr. LAUBENGAYER.

This course is a survey of the fundamental facts and principles of plant life. After a study of the plant cell, the structures and life processes of the higher plants are examined in some detail. In this connection, considerable attention is given to information necessary in the prosecution of more advanced or practical work connected with plants. A careful study is then made of the form, structure, and reproduction of representatives from the principal groups with a view to orient the student in the plant kingdom, and to acquaint him with the principal evolutionary tendencies exhibited. The course concludes with a study of the principal families of flowering plants, with practice in their identification. Laboratory fee, \$7.

**S 2. Plant Physiology.** Credit four hours. Equivalent to Botany 31. Prerequisite course S 1 or its equivalent, chemistry, and permission to register. Lectures, M T W Th F, 12. Laboratory, T W Th F, 9-12. *Stone.* Assistant Professor KNOTT.

This course is designed to acquaint the student with the important life processes of plants. Topics such as water-relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, and growth relations are studied in some detail and particular emphasis is placed both in laboratory and in classroom on discussions of the principles and their application to growing plants. Laboratory fee, \$4; deposit, \$2.

**S 3. Taxonomy of Vascular Plants.** Credit four hours. Prerequisite course S 1 or its equivalent. Lectures, M T W Th, 2. Laboratory, M T W Th, 3-6, F, 2-5. Several all-day field trips will be arranged. *Stone*. Professor WIEGAND.

A study of the kinds of seed plants and ferns; their classification into genera, families, and orders; and field work on the local flora. Emphasis will be placed on wild plants, but the more common cultivated plants will have some attention. The course is planned to follow Course 1 and to furnish an introduction to the knowledge of field botany and to the classification of the higher plants, in preparation for special work in various departments and as an aid in teaching. Instruction will be given in herbarium methods. Laboratory fee, \$4; deposit, \$5.

**S 4. Comparative Morphology of Fungi.** Credit four hours. Equivalent to Plant Pathology 121. Prerequisite course S 1 or its equivalent and permission to register. Lectures, M T W Th F, 9. *Bailey, West Basement*. Laboratory, fifteen actual hours a week, by arrangement. *Bailey, East Basement*. Professor FITZPATRICK.

An elementary synoptical course designed to acquaint the student with the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy, but abundant opportunity is given for field work. Laboratory fee, \$6; deposit, \$3.

**S 7. Mycology.** Credit four hours. Prerequisite courses S 1 and S 4 or their equivalent and permission to register. Lectures, M T W Th F, by appointment. Laboratory, fifteen actual hours a week, by arrangement. *Bailey, East Basement*. Professor FITZPATRICK.

An advanced course designed for students who wish to specialize in mycology or plant pathology. An intensive study of the morphology, taxonomy, cytology, and phylogeny of the fungi. Emphasis is placed on the field work and extensive practice in determination of material is gained. The individual student may obtain the equivalent of either term of Plant Pathology 221 or Plant Pathology 222, and by repeating the course in successive summers may get the others. Any one of the following groups may be elected: (a) Phycomycetes, (b) Ascomycetes, (c) Basidiomycetes, (d) Uredinales, Ustilaginales, Fungi Imperfecti, and Myxomycetes. Laboratory fee, \$6; deposit, \$3.

**S 5. Plant Anatomy.** Credit four hours. Prerequisite course S 1 or an equivalent and permission to register. Laboratory, M T W Th F, 8-11:30. Hours for lectures and recitations will be arranged during these periods. *Stone*. Assistant Professor WILSON.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in interpretation and determination of material. It is planned not only for students desiring training in botany, but also for those in applied fields, such as pathology, pomology, and genetics. Laboratory fee, \$5.

**S 10. General Plant Pathology.** Credit four hours. Equivalent to Plant Pathology 1. Prerequisite Botany S 1 or its equivalent and permission to register. Lectures, M W F, 2. *Bailey, West Basement*. Laboratory, the completion of a minimum of twenty exercises requiring not less than twenty actual hours a week, with personal conferences upon each. Conferences by arrangement. Laboratory at the student's convenience. Assistant Professor WELCH.

A fundamental course treating of the nature, cause, and control of plant diseases illustrated by studies of the commoner diseases of cultivated crops. Admission limited to twenty students. Laboratory fee, \$4.50; deposit, \$3.

**S 19. Special Problems with Plants.** Credit two or more hours. Hours to be arranged. In registering for this course the name of the professor with whom the work is to be taken must be stated.

Students who are sufficiently prepared may arrange to engage in the study of some problem or special topic. Such work may lie in the fields of general or taxonomic botany, anatomy, mycology, cytology, plant physiology, paleobotany, plant pathology, or genetics. A member of the staff must supervise the work.

### COURSES DEALING PRIMARILY WITH ANIMALS

**S 20. General Zoology.** Credit six hours. Lectures, M T W Th F, 9. *McGraw* 5. Laboratory, M T W Th F, 1:40-4. *McGraw* 2A. Field studies to be arranged. Professor REED and Assistant Professor YOUNG.

A comprehensive view of Animal Biology including the principles and nature of structural and functional organization in the animal body, the animal viewed as an organism, the progress of perfection in animals as revealed through the study of living forms, the pathways and principles of evolution, and modern zoological concepts. The laboratory periods are devoted to the study of animal types. Laboratory fee, \$5.

**S 21. Systematic Vertebrate Zoology and Ecology.** Credit four hours. Lectures, Th F, 9 and 12. *McGraw* 7. Laboratory and field work, Th F, 10-12, 1:40-5, W, 2-5. Several all-day trips are required. Occasionally a field trip, 5:30-8 A.M. or 5-8 P.M., may be substituted for the regular periods. Professor WRIGHT.

Lectures on fishes, amphibians, reptiles, birds, and mammals; their habits, life-histories, coloration, respiration, locomotion, reproduction, and adaptations; together with their classification, nomenclature, characters, and relationships. Laboratory study of the parts employed in the classification of these groups, with training in the identification of two hundred and forty North American species. Field work is partly to give practice in field observations and in ready identification of local vertebrates in their natural environment, and partly to introduce some ecological methods. Textbook: Jordan's *Manual of Vertebrates of the Northeastern United States*, New edition. Laboratory fee, \$4.

**S 22. Invertebrate Zoology.** Credit four hours. Prerequisite Zoology S 20 or an equivalent and permission to register. Daily except Sat., 9-12:30. Field trips, laboratory work, and discussions will be arranged during these periods. Assistant Professor YOUNG.

This course should provide a better foundation for the advanced student in the field of zoology or give to the teacher a knowledge of a larger variety of forms available for use in general courses either in high schools or in colleges. It differs from the type of invertebrate course offered by marine biological laboratories in that stress is laid upon many species which may be secured in the living state away from the shore. Methods used in collecting and the study of habitats are the more important objectives of the field trips. Classification, structure, and life cycles are emphasized in the laboratory. Laboratory fee, \$3.

**S 23. Comparative Anatomy of Vertebrates.** Credit four hours. Lectures, daily except Sat., 8. *McGraw* 5. Laboratory, fifteen hours a week at times to be arranged. Professor REED and Mr. SENNING.

A thorough dissection and study of the several systems of organs in a selected series of vertebrate types. The various systems are considered with reference to their significance in progressive modifications and their bearing upon vertebrate descent. The lectures deal with the problems of comparative anatomy. This course is the equivalent of Animal Biology II given during the academic year. Laboratory fee, \$6.

**S 26. Histology.** The tissues and their histogenesis. Credit four hours. No prerequisite, but previous work in biology, zoology, and botany or physiology is recommended. Lectures, M T W Th F, 12. The laboratory will be open every morning except Saturday. *Stimson*. Professor KINGSBURY.

For students of biology or those preparing for medicine. The cell and cellular origin of the body; the structure and development of its component tissues. Each student will prepare or receive a series of typical microscopic preparations.



The courses in histology and embryology are given in the histological laboratories in *Stimson Hall*. The department is well equipped for instruction in both subjects, having a large and adequate supply of modern microscopical instruments and an extensive collection of demonstration material for both histology and embryology. Microscopes are furnished by the department. Consultation with the instructors previous to registration is advised. Laboratory fee, \$6.

**S 27. Embryology of Vertebrates.** Credit four hours. Prerequisite a course in the histology of the tissues or a satisfactory equivalent in other biological work involving training in the use of the microscope. Lectures, M T W Th F, 9. The laboratory will be open every morning except Saturday. *Stimson*, Assistant Professor ADELMANN.

For students of biology or those preparing for medicine. Preparation and study of embryological specimens from all the chief groups of vertebrates. Particular emphasis is placed on the embryology of the chick. The student also acquires a knowledge of special methods useful in embryological work. Laboratory fee, \$6.

**S 30. General Entomology.** Credit three hours. Equivalent to Animal Biology 3, or Entomology 12. Prerequisite Biology I or Zoology I or its equivalent. Lectures, M T W Th F, 10. Practical exercises, M W F, 1:40-4. *Roberts* 392. Professor MATHESON.

This course includes lectures and demonstrations on the characteristics of the orders and families of insects, with a study of their habits, life-histories, and relations to other animals and to plants. The laboratory work consists of the study of the structure, ecology, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *An Introduction to Entomology*. Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

**S 31. Elementary Morphology of Insects.** Credit three hours. Equivalent to Entomology 21. Twenty actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects as the locust, roach, cicada, honeybee, crane-fly, etc. Laboratory fee, \$2.

**S 32. Elementary Systematic Entomology.** Credit two hours. Equivalent to Entomology 15 and 31a. Prerequisite course S 31. Fifteen actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

The principles of wing venation and the classification of the orders and families. Laboratory fee, \$2.

Courses S 31 and S 32 are required of all students who plan to take advanced work in Entomology.

[S 34. **Advanced Morphology and Histology of Insects.** Credit two hours. Prerequisite courses S 31 and S 30 or S 32. Lectures, assigned reading, and reports.] Not given in 1930.

**S 35. Histology of Insects.** Credit two hours. Must be preceded or accompanied by course S 31. Laboratory, fifteen actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

Technique in histological methods as applied to insects. Laboratory fee, \$3.

**S 39. Special Problems with Animals.** Credit two hours or more. Hours to be arranged. In registering for this course the name of the professor with whom the work is to be taken must be stated.

Students who are sufficiently prepared may arrange to engage in the special study of some problem or special topic. Such work may lie in the fields of general zoology, invertebrate zoology, systematic vertebrate zoology, comparative anatomy of vertebrates, ornithology, histology, embryology, general entomology, systematic entomology, economic entomology, or general biology. A member of the staff must supervise the work.

## GENERAL COURSES DEALING WITH BOTH PLANTS AND ANIMALS

**S 40. Genetics.** Credit four hours. Prerequisite elementary botany and plant physiology, or elementary zoology and animal physiology, and permission to register. Courses in cytology and in taxonomic botany and zoology will be found helpful. Lectures, M T W Th F, 8. Laboratory, M W F, 1:40-4. Conferences to be arranged. *Fernow* 212. Assistant Professor FRASER.

A general introductory course designed to acquaint the student with the fundamental principles of heredity and variation. Special attention is given to the Mendelian interpretation of the facts of inheritance. Among the topics to be discussed are: the physical basis of heredity; determination of sex; factor linkage; measurement of variation; quantitative inheritance; pure lines; inbreeding and cross-breeding; cytoplasmic inheritance; and mutation; with suggestions as to the relation of genetical principles to eugenics. Laboratory studies of variation and of the laws of heredity as illustrated by hybrid material in plants and by breeding experiments with the fruit fly, *Drosophila*. Laboratory fee, \$3.

[**S 6. Cytology.** Credit three hours. Prerequisite course S 1 or course S 20 or their equivalent, and permission to register.

A course for those who have had some fundamental work in biology. The principal topics studied are protoplasm, cells and their components, nuclear and cell divisions, meiosis and fertilization, together with their bearing on the problems of development, reproduction, and heredity. Both plant and animal materials are used. Microtechnique is not included. Laboratory fee, \$5.] Not given in 1930.

**S 42. General Bacteriology.** Credit four hours. Prerequisite some work in microscopy. Lectures, M T W Th F, 9. Laboratory, M T W Th F, 10-1. *Veterinary College*. Professor HAGAN.

A general introductory course in bacteriology covering the distribution, morphology, biology, and methods of study of micro-organisms. The latter half of this course is concerned with the bacteriology of water, sewage, milk, and milk products, the fermentation industries, and of some of the more important human and animal diseases. The laboratory work is closely correlated with the subject matter of the lectures. After a number of sessions devoted to the development of technique, there follows work on the bacteria of air, water, milk, fermentation processes, and of disease. Laboratory fee, \$10.

# NEW YORK STATE SUMMER SESSION

AT

CORNELL UNIVERSITY

## OFFICERS

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.  
ALBERT RUSSELL MANN, B.S., A.M., Dean of the Colleges of Agriculture and Home Economics.

ROLLAND MACLAREN STEWART, B.A., Ph.D., Professor of Rural Education and Director of the New York State Summer Session.

CORNELIUS BETTEN, Ph.D., D.Sc., Director of Resident Instruction in the Colleges of Agriculture and Home Economics.

MARTHA VAN RENSSELAER, A.B., Director of the College of Home Economics.  
FLORA ROSE, M.A., Director of the College of Home Economics.

OLIN WHITNEY SMITH, B.S., Secretary of the Colleges of Agriculture and Home Economics.

ELLEN FITCHEN, A.B., Secretary in the College of Home Economics.

## STAFF OF INSTRUCTION

(The names of the instructors in the College of Agriculture are printed on page 62; those of the instructors in the College of Home Economics, on page 81; those of the instructors in the Summer School of Biology, on page 53; those of the instructors in Hotel Administration, on page 85.)

## COURSES OF INSTRUCTION

Courses of instruction are offered in the New York State Summer Session under the auspices of the New York State College of Agriculture and of the New York State College of Home Economics. These courses are designed primarily to meet the needs of persons engaged in the various forms of educational work concerned with agriculture, home economics, science, and other subjects of study particularly related to the problems of rural life. Teachers, supervisors of instruction, superintendents or principals of schools, extension workers, parents, dietitians, students interested in the study of farm and home practices, camp directors, and others responsible for the improvement of rural workers have primary consideration in the program of courses.

## ADMISSION

Admission to classes, including the special unit courses listed on page 80 is limited to regularly registered students. No examinations are required for entrance, but the candidate for admission must show that he is qualified to pursue the work offered. He must register for all courses that he expects to attend whether or not he wishes credit. He must register for a minimum of four hours unless he has special permission of his adviser and the approval of the Director. Advice for registration is given through regular advisers who are members of the Summer Session staff, and who approve the registration cards. See page 61 for the directions about registration.

The graduate student should advise with the representative of his major subject if he is matriculating for a degree; or with an adviser selected by the student from the members of the Faculty representing his field of work, if he is not a candidate for a degree. See page 6 of the 1929-30 *Announcement of the Graduate School*. Note the University regulation concerning vaccination on page 6 of the same announcement. Students expecting to matriculate in the University at the opening of the Summer Session should bring a certificate of vaccination.

### TUITION AND FEES

Tuition in any of the courses offered in the New York State Summer Session except those in the Summer School of Biology and the Summer Courses in Hotel Administration, see pages 53, 85, is free to admitted students who are residents of New York, and who have been residents for at least one year immediately preceding registration. An incidental fee of ten dollars is, however, charged to all students resident in New York. Persons coming from outside of the State of New York, whether they take one course or more, will pay sixty dollars, except persons registered for special unit courses, see page 80, who will pay at the rate of ten dollars a week. Students not resident in New York do not pay the incidental fee. For the time and place of payment, see page 14.

In certain courses laboratory fees are charged. These are indicated in the descriptions of the courses. Fee cards must be secured from the instructor at the first exercise, and must be returned to him receipted within five days.

Graduate students who register in the Summer Session as candidates for advanced degrees are required to pay a tuition fee of sixty dollars. (P. 14). If they have not previously matriculated in Cornell University, they must pay also a matriculation fee of ten dollars. See page 15. Candidates for advanced degrees who are registered for study under Personal Direction during the intersemester periods are required to pay an additional administration fee of ten dollars.

In the Summer School of Biology, see page 53, the tuition is sixty dollars for all students including residents of New York.

In the Summer Courses in Hotel Administration the tuition is thirty dollars for each of the periods; see page 85.

A fee of three dollars (one dollar for students in special unit courses only) is charged to summer students for the privileges of Willard Straight Hall. See page 20.

### ACADEMIC CREDIT

A student who has previously satisfied the entrance requirements for the College in which he wishes credit may obtain credit for work in the New York State Summer Session up to a limit of eight semester hours. Rarely, however, should students plan to register for more

than six semester hours. Students are not permitted to visit classes but may register for courses which they desire to attend without credit, if the instructor is willing. Residence credit is given if six hours are passed, but not more than a total of two semesters of residence may be obtained by attendance at summer sessions.

Candidates for degrees should consult the announcements of the respective colleges, since much of the work required for degrees, if offered in the Summer Session at all, is distributed over a period of years. For the requirements for the degree of Bachelor of Science (eight semesters, 122 hours, etc.) see the announcements of the New York State College of Agriculture and the New York State College of Home Economics. For advanced degrees see the *Announcement of the Graduate School*.

#### TEACHERS' CERTIFICATES

The New York State Department of Education through its Teacher Training Division is responsible for the certification of teachers. The courses offered during the summer enable students to meet these requirements. For information on certificates for work done, see page 12.

#### GENERAL INFORMATION

For other information of a general character, see pages 9 to 21.

#### DIRECTIONS FOR REGISTRATION

Students should observe the following directions to simplify registration and avoid confusion:

1. Note on page 14 that Saturday, July 5, is Registration Day. The student should plan to register on that day if possible.
2. Go directly to the office of the Secretary in Roberts Hall and secure a registration card.
3. Take this card to a staff adviser in Roberts Assembly, who will assist in the selection of courses and give further direction if needed.
4. When the selection is completed and the schedule is approved return the card to the Secretary's office for official approval.
5. Pay tuition and fees at the office of the Treasurer, Morrill Hall.

# SUMMER SCHOOL OF AGRICULTURE

## IN THE

### NEW YORK STATE COLLEGE OF AGRICULTURE

#### STAFF OF INSTRUCTION

ARTHUR AUGUSTUS ALLEN, Ph.D. ....	Ornithology
(Professor of Ornithology)	
ELSA GUERDRUM ALLEN, Ph.D. ....	Ornithology
(Instructor in Ornithology)	
WALFRED ALBIN ANDERSON, Ph.D. ....	Rural Social Organization
(Professor of Sociology, North Carolina State College of Agriculture and Engineering)	
THOMAS LEVINGSTON BAYNE, jr., Ph.D. ....	Rural Education
(Assistant Professor of Rural Education)	
A. BRIDGES, M.A. ....	Agricultural Economics and Farm Management
(Advisory Economist of the Agricultural Economic Research Institute, Oxford, England)	
SAMUEL A. BROWNELL, Ph.D. ....	Rural Education
(Superintendent of Schools, Grosse Point, Michigan)	
ISABELLE FRISBIE BULL. ....	Rural Education
(Instructor in Rural Education)	
JULIAN EDWARD BUTTERWORTH, Ph.D. ....	Rural Education
(Professor of Rural Education)	
CARL G. CHAMBERLAIN. ....	Physical Education
(Director of Physical Education, Charlotte High School, Rochester)	
PETER WALTER CLAASSEN, Ph.D. ....	Biology
(Professor of Biology)	
ANNA BOTSFORD COMSTOCK, B.S. ....	Rural Education
(Emeritus Professor of Nature Study)	
JAMES E. CROUCH, B.S. ....	Ornithology
(Assistant in Ornithology)	
RALPH WRIGHT CURTIS, M.S.A. ....	Floriculture and Ornamental Horticulture
(Professor of Ornamental Horticulture)	
R. R. ENFIELD. ....	Agricultural Economics and Farm Management
(Economist in the Ministry of Agriculture, Great Britain)	
RALPH ALMON FELTON, M.A. ....	Rural Social Organization
(Extension Professor of Rural Social Organization)	
CHARLES BURT GENTRY, M.S. ....	Rural Education
(Professor of Agricultural Education and Dean of the Division of Teacher Training, Connecticut Agricultural College)	
ARTHUR KENDALL GETMAN, B.S. ....	Rural Education
(State Department of Education, Albany)	
EVA L. GORDON, B.S. ....	Rural Education
(Assistant in Nature Study)	
WILLIAM JOHN HAMILTON, jr., B.S. ....	Biology
(Assistant in Biology)	
MANLEY H. HARPER, Ph.D. ....	Rural Education
(Professor of Education, Jamaica, N. Y., Training School)	
JOHN FREDERICK HARRIOTT, Ph.D.,	
Agricultural Economics and Farm Management	
(Assistant Professor of Farm Management)	
HAZEL HICKS, M.A. ....	Rural Education
(State Normal School, Geneseo, New York)	
H. W. HOCHBAUM, B.S.A. ....	Rural Education
(United States Department of Agriculture)	
EDWIN RAYMOND HOSKINS, M.S.A. ....	Rural Education
(Instructor in Rural Education)	

CHESTER JERMAIN HUNN, B.S.A. . . . .	Floriculture and Ornamental Horticulture (Assistant Professor of Ornamental Horticulture)
OSKAR AUGUSTUS JOHANNSEN, Ph.D. . . . .	Entomology (Professor of Entomology)
PETER PAUL KELLOGG, B.S. . . . .	Rural Education (Assistant in Nature Study)
PAUL J. KRUSE, Ph.D. . . . .	Rural Education (Head of the Department of Rural Education)
CLAUDE L. KULP, B.S. . . . .	Rural Education (Assistant Superintendent of Schools, Ithaca, New York)
CARL EDWIN LADD, Ph.D. . . . .	Rural Education (Director of Extension)
LAURENCE HOWLAND MACDANIELS, Ph.D. . . . .	Pomology (Professor of Pomology)
DEAN RICHMOND MARBLE, M.S. . . . .	Poultry Husbandry (Instructor in Poultry Husbandry)
ROBERT MATHESON, Ph.D. . . . .	Entomology (Professor of Entomology)
ALFRED MARTIN MEYER, A.M. . . . .	Rural Education (Director, Junior High School, Orlando, Florida)
LUA ALICE MINNS, M.S.A. . . . .	Floriculture and Ornamental Horticulture (Instructor in Floriculture)
RICHARD ALAN MORDOFF, Ph.D. . . . .	Meteorology (Professor of Meteorology)
WALTER CONRAD MUENSCHER, Ph.D. . . . .	Botany (Assistant Professor of Economic Botany)
E. LAURENCE PALMER, Ph.D. . . . .	Rural Education (Professor of Rural Education)
JAMES BECKLEY PALMER, B.S. . . . .	Rural Education (State Normal School, Potsdam, New York)
GEORGE ERIC PEABODY, M.S. . . . .	Extension Teaching (Assistant Professor of Extension Teaching)
JOSEPH PULLMAN PORTER, M.S.A., M.L.D., Floriculture and Ornamental Horticulture (Extension Assistant Professor of Ornamental Horticulture)	
LOUIS MICHAEL ROEHL, B.S. . . . .	Rural Engineering (Assistant Professor of Rural Engineering in Charge of Farm Shop)
EZRA DWIGHT SANDERSON, Ph.D. . . . .	Rural Social Organization (Head of the Department of Rural Social Organization)
ELMER SETH SAVAGE, Ph.D. . . . .	Animal Husbandry (Professor of Animal Husbandry)
JAMES MORGAN SHERMAN, Ph.D. . . . .	Dairy Industry (Head of the Department of Dairy Industry)
RAY P. SNYDER . . . . .	Rural Education (Chief, Rural Education Bureau, State Department of Education, Albany)
JOHN NELSON SPAETH, M.F. . . . .	Forestry (Research Assistant Professor of Forestry)
LELAND SPENCER, Ph.D. . . . .	Agricultural Economics and Farm Management (Professor of Marketing)
CLIFFORD NICKS STARK, M.A. . . . .	Dairy Industry (Assistant Professor of Bacteriology)
ROLLAND MACLAREN STEWART, Ph.D. . . . .	Rural Education (Director of the New York State Summer Session and Professor of) Rural Education)
HOMER COLUMBUS THOMPSON, Ph.D. . . . .	Vegetable Gardening (Head of the Department of Vegetable Gardening)
MARION VAN LIEW, B.S. . . . .	Rural Education (Chief, Home Economics Bureau, State Department of Education, Albany)
MARTHA VAN RENSSELAER, A.B. . . . .	Rural Education (Director of the College of Home Economics)

E. E. VIAL, Ph.D. ....	Agricultural Economics and Farm Management (Bureau of Agricultural Research, United States Department of Agriculture)
LILA MERLE WELCH, A.M. ....	Rural Education (Assistant Professor, University of Missouri)
ANDREW LEON WINSOR, Ph.D. ....	Rural Education (Instructor in Rural Education)
LOUIS EDWARD WOLF, M.S. ....	Entomology (Instructor in Entomology)
PAUL WORK, Ph.D. ....	Vegetable Gardening (Professor of Vegetable Gardening)
FORREST BLYTHE WRIGHT, M.S. ....	Rural Engineering (Instructor in Rural Engineering)

### AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

**S 102. Farm Management.** Credit three hours. Lectures, daily except Sat., 8. Laboratory, T, 1:40-4; S, all day. *Farm Management 102.* Assistant Professor HARRIOTT.

It is desirable that this course be preceded by courses dealing with the production of crops and animals or that the student have considerable farm experience in crop and animal production.

Lectures, recitations, laboratory practice, and field trips. Farming as a business; types of farming; size of business; balance of business; rates of production; farm layout; building arrangement; machinery; buying and selling; ways of starting to farm; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms. Field trips to farms near by will be made on Saturdays. Trips begin at 8 a. m. One two-day trip will probably be arranged. Laboratory fee, \$2.

By special arrangement, the student registered for special-unit courses may take a two-weeks' course for which he will receive one hour's credit.

**S 111. Agricultural Statistics.** Credit three hours. Lectures, daily except Sat., 11. Laboratory, M W, 1:40-4. *Farm Management 102.* Dr. VIAL.

Classification of data; frequency distributions; means and variables; gross, partial, and multiple correlations; and analysis of time series. Fee for materials furnished, \$3.

**S 115. Agricultural Prices.** Credit one hour. Lectures, M W F, 8. *East Roberts 232.* Dr. VIAL.

Factors affecting farm prices.

**S 147. Marketing—Methods and Results of Research.** Credit three hours. Lectures and discussions, daily except Sat., 9. Laboratory, W F, 1:40-4. *Marketing.* Professor SPENCER.

A critical study will be made of research projects in marketing. Special attention will be given to objectives; methods of gathering and analyzing the data; results and costs. Various commodity groups such as dairy products, fruits, and vegetables, grain, livestock, cotton, and farm supplies; and various aspects of marketing such as demand and supply, margins and costs, prices, and cooperation will be included among the projects selected for study.

This course may be taken in units of two weeks each, for one hour credit. Subject matter will be arranged as follows: July 7 to 18, dairy products; July 21 to August 1, fruits and vegetables; August 4 to 15, other commodities and cooperative marketing.

**S 151a. Agricultural Policy in Great Britain.** July 7 to July 25. Credit one hour. Lectures daily except Sat., 10. *Farm Management 102.* Professor BRIDGES.

Land tenure; small holdings; the question of land nationalization; marketing; state action with reference to such problems as grading and control of disease.

**S 151b. Agricultural Prices and Credit.** July 28 to August 15. Credit one hour. Lectures daily except Sat., 10. *Farm Management 102.* Professor ENFIELD.

Fundamental causes of price fluctuations; effect of monetary changes on British



agriculture; proposals for the stabilization of prices; agricultural credit with particular reference to British Joint Stock banks, the British Agricultural Mortgage Corporation; special legislation for financing agricultural improvements; cooperative credit societies.

**S 168. Special Lectures on Economic and Educational Problems.** Credit one or two hours. Lectures, M W F, 12. Discussion period, M W F, 4. *Farm Management* 102. Credit one hour for those who take the 12 o'clock lectures only; two hours for those who take both periods. Department of Rural Education co-operating. Professor SPENCER in charge.

A series of discussions by non-resident lecturers of certain economic and educational problems related to agriculture.

### ANIMAL HUSBANDRY

**S 50a. Feeding the Dairy Cow for Milk Production.** Credit one or two hours. Daily except Sat., 11. Laboratory, M W, 1:40-4. July 7-18. For two hours' credit, see instructor for additional periods. *Animal Husbandry A*. Professor SAVAGE.

A special-unit course for teachers of agriculture, county agents, and other agricultural leaders, dealing with the special problems of feeding the dairy cow and their solution in the light of scientific investigation.

### BACTERIOLOGY

**S 1. General Bacteriology.** Credit two or four hours. Lectures, daily except Sat., 1:40. Laboratory, daily except Sat., 2:30-4:30. *Dairy* 119. Professor SHERMAN and Assistant Professor STARK.

An introductory course giving a general survey of the field of bacteriology, together with the fundamentals essential to further work in the subject. The morphology, physiology, and classification of bacteria; the culture of micro-organisms, simple and differential staining, and general bacteriological technique; the bacteriology of soil, air, water, sewage, milk, and foods; the principles of immunity and the microbiology of disease.

Laboratory fee, \$10, for those seeking four credit hours.

### BIOLOGY

**S 1. General Biology.** Credit three hours. Lectures and recitations, daily except Sat., 9. *Roberts* 392. Laboratory and field work, M W F, 1:40-4; other sections by special arrangement. *Roberts* 302. Professor CLAASSEN and Mr. HAMILTON.

This course is designed to acquaint the general student and the prospective teacher with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. Lectures, laboratory work, and field trips will deal with such topics as: interdependence of organisms as illustrated by insects and flowers, insects and gall, etc.; the simpler organisms, such as amoeba, paramoecium, flagellates, and other protozoans; and algae, fungi, bacteria, and slime molds among plants. The study of these simpler organisms will be followed by studies of such plant types as liverworts, mosses, and ferns, and such animal types as hydra, earthworm, and frog. Students completing this course will be given credit for the first term's work in Biology 1 of the regular academic year. Laboratory fee, \$3.50.

**S 2. Laboratory Methods in Biology.** Credit one hour. Conferences and laboratory work, M W, 10-1. *Roberts* 302. Mr. WOLF and Mr. HAMILTON.

This course is open only to teachers of biology who have had considerable training in biological sciences. Instructor's permission necessary for registration.

This course takes up the problem of laboratory technique, the collection and preservation of class material, the general equipment of the laboratory, and other questions encountered in the management of a laboratory. Teachers who wish to study methods of teaching are referred to Course S 126 in Rural Education. Laboratory fee, \$3.

**S 3. Advanced Biology.** Credit three hours. Lectures, M T Th F, 11. *Roberts* 392. Field work and laboratory exercises, T Th F, 1:40-4. *Roberts* 302. Prerequisite college biology, botany, or zoology. Professor CLAASSEN and Mr. WOLF.

A course dealing with the biological principles of plant and animal life. Heredity, variation, natural selection, mutation, adaptation, life cycle, and metamorphosis, are some of the topics for consideration. Special emphasis is placed upon field studies of the ecological relationships of organisms and students should come prepared for field work.

This course, although not identical with the second term biology of the regular year, will be accepted in place thereof. Laboratory fee, \$3.50.

## SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State College of Agriculture and the Summer Session of Cornell University, there has been brought together a group of courses dealing with the biological sciences. These courses furnish an excellent opportunity for students of the biological sciences to have access to a series of studies from year to year in one of the most appropriate locations in the country. For full information see page 53.

### BOTANY

**S 13. Trees and Shrubs.** Credit two hours. Lectures and laboratory, M W, 1:40-5:30, or T Th, 1:40-5:30. Additional trips to be arranged. *Stone*. Assistant Professor MUENSCHER.

A course intended for those who wish to know the woody plants in the field. The aim is to familiarize the student with as many as possible of the trees and shrubs of the Cayuga Lake flora and to teach the main facts of structure, growth, habit, and distribution concerning them. Some all day trips will be required. Laboratory fee, \$1.50; deposit, \$3.

Other courses in the biological sciences are offered in the Summer School of Biology; see page 54.

### ENTOMOLOGY

**S 30. General Entomology.** Credit three hours. Identical with S 30 in the Summer School of Biology. Prerequisite Biology I, or Zoology I or its equivalent. Lectures, daily except Sat., 10. Practical exercises, M W F, 1:40-4. *Roberts* 392. Professor MATHESON.

This course embraces lectures and demonstrations on the characteristics of the orders and families of insects; their habits, life histories, and relations to other animals and to plants; methods of rearing, studying, collecting, and mounting insects.

The laboratory work will consist in the study of structure, ecology, metamorphoses, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *An Introduction to Entomology*. Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

**S 31. Elementary Morphology of Insects.** Credit three hours. Twenty actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects, such as the locust, roach, cicada, honeybee, crane-fly, etc. Laboratory fee, \$2.

### EXTENSION TEACHING: ORAL EXPRESSION

**S 100. Oral Expression.** Credit two hours. Lectures and practice, daily except Sat., 10. *Roberts* 131. Criticism by appointment, daily 8-1. Registration limited to twenty-five students. Open only to upperclassmen and regular summer school students. Assistant Professor PEABODY.

Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technique of public speech. Designed to acquaint students with parliamentary practice, to encourage interest in public affairs, and, through demonstrations and the use of graphic material and other forms, to train for effective self-expression in public.

**S 100a. Oral Expression.** No credit. For students registered in special unit courses, see page 80. Given in two two-week periods, July 7 to 19 and August 4 to 15. Daily except Sat., 11. For content of the course, see S 100. Assistant Professor PEABODY.

## FLORICULTURE AND ORNAMENTAL HORTICULTURE

**S 1. Woody Plant Propagation and Nursery Work.** Credit one hour. Lectures, T Th, 9. Laboratory, W F, 1:40-4. Laboratory fee, \$3. *Floriculture and Nursery.* Assistant Professor HUNN.

This course includes the methods of propagation of all classes of ornamental woody plants and their special treatment during the first stages of growth. It also acquaints the student with the principles governing the transplanting of trees, shrubs, and herbaceous perennials, and with the methods practiced in all types of commercial nursery management. Should be accompanied by S 3 and S 4. All members of the class must participate in an excursion to some New York State nursery on August 14.

**S 3. Landscape Planting.** Credit one hour. Lectures and laboratories, T, 10-1, W, 11-1. Should be accompanied by S 6 and must be accompanied by S 4. *Caldwell 400. Greenhouses and Campus.* Assistant Professor PORTER.

A brief course intended to familiarize the student with the best trees, shrubs, and vines for landscape work and their use. Names, characteristics, and requirements will be studied in the field and in the laboratory. The lectures will deal with planting practices and the selection and arrangement of plants. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

**S 4. Landscape Planning.** Credit two hours. Lectures and laboratories, W, 8-11, Th, 1:40-4:30, F, 9-12. Should be accompanied by S 6; either S 3 or S 8 is required. All members of the class must participate in an excursion to Rochester and Canandaigua on August 8 and 9. Not a professional course. *Caldwell 400.* Assistant Professor PORTER.

A discussion of the fundamental principles involved in landscape planning as related to the home grounds, school grounds, and other landscape improvement work. A brief course intended for students who desire an intelligent point of view but who do not intend to take technical courses. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

**S 5. Indoor Flower Growing.** Credit one hour. Lectures, T Th, 11. Laboratory, T, 1:40-4:30. *Countryman Building and Greenhouses.* Miss MINNS.

The propagation and culture of plants suitable for winter gardens in homes and schoolrooms, including a study of containers, soils, fertilizers, insecticides. The selection of varieties of bulbs and methods of culture indoors are considered, as are also the method of propagation and general care of species of plants suited for indoor culture. Laboratory fee, \$1.

**S 6. Garden Flowers.** Credit two hours. Lectures, M T Th, 9, F, 12. Laboratory, W F, 1:40-4:30. *Countryman Building and Gardens.* Miss MINNS. Laboratory fee, \$2.

This course, planned primarily for graduate and advanced students in floriculture and ornamental horticulture, comprises a study of herbaceous plant materials. The aim is to give the student such an intimate knowledge of these forms of plants as may be used in garden planting, either on home grounds, rural social centers, or public parks, more particularly with reference to summer conditions. Students must have had sufficient botany to be familiar with the botanical characters and classification. An excellent collection of plant material is available for demonstrations. All members of the class will participate in an excursion to the Thompson Estate at Canandaigua on August 8 and 9.

**S 8. Woody Plant Materials for Landscape Planting.** Credit four hours. Lectures, M T Th F, 8. Laboratory and field trip, M T, 10-12:30, W Th, 11-1, M T, 1:40-4:30. *Greenhouses* and *Campus*. Professor CURTIS. Intended for graduate students and advanced students in floriculture and ornamental horticulture. Laboratory fee, \$3.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting. The laboratories and field trips enable the student to recognize common woody plants. The lectures discuss planting areas, planting practices, and plant materials, in order that the student may learn to see plants not only as growing things but as possible units in designs with which he may be able to improve his surroundings. All members of the class must participate in an excursion to Rochester on August 8 and 9 to visit private estates and public parks. The transportation charge will be \$5.

**S 9. Summer Propagation.** Credit two hours. Lectures, W Th, 10. Laboratories, W, 8-10, Th, 1:40-4:30, F, 9-12. *Greenhouses* and *Nurseries*. Assistant Professor HUNN. Intended for students who have had the beginning course in propagation. See S 1. Laboratory fee, \$3.

Advantage is taken of the summer months to amplify the regular and summer courses in propagation by intensive practice in the summer production of soft wood cuttings and in the budding of nursery stocks. This will include the management of hot beds and the lining-out system followed in the production of stock plants. Two extra hours a week before and after classes are required for care of hot beds. Two one-day trips are planned for visits to producing nurseries on July 10 and August 14.

## FORESTRY

**S 1. Tree Identification.** Credit one hour. Lectures, T Th, 8. Field Work, T, 1:40-4:30. *Fernow 122*. Assistant Professor SPAETH.

Identification of the more important trees of the Ithaca region. Characteristics of forest trees that may be observed at various seasons of the year. Tree seeds and their dissemination. The commercial uses of a few of the principal trees. This course should be helpful to teachers in connection with their work in nature study and biology. See Biology S 1 and Nature Study S7a.

**S 4. Forests and Forestry.** Credit two hours. Lectures, daily except Sat., 9. Lecture or discussion period, M W, 2. Assistant Professor SPAETH.

This course is designed to meet the requirements of those who wish an elementary knowledge of forestry. Topics to be considered: the nature and scope of forestry; the economic importance of forests to the nation, including the influence of forests on stream-flow and the relation of the forest to recreation; the forest as a biological unit; methods employed in the perpetuation of forests; brief description of the forest region of the United States; the present status of Federal, State, and private forestry.

This course should be helpful to teachers in secondary schools whose syllabuses in Biology, Civics, Economics, Physical Geography, and General Science include forestry topics.

## METEOROLOGY

**S 1. Meteorology and Climatology.** Credit two hours. Lectures and discussions, daily except Sat., 10. *East Roberts 222*. Professor MORDOFF.

This course is adapted to the needs of teachers and students in subjects of which weather and climate are important factors, particularly teachers of physical geography and general agriculture. It is designed to acquaint the student with the laws governing the primary and secondary circulation of the atmosphere and with the development, progression, and conditions that attend cyclones, tornadoes, and other atmospheric phenomena. Attention is given to the principles and practice of weather forecasting from weather maps and from local observations.

**S 2. Meteorology and Climatology, Laboratory Course.** Credit one hour. W F, 1:40-4, or other periods to be arranged. Must be accompanied by Course S 1. *East Roberts 341*. Professor MORDOFF.

The work consists in the study of the principal weather and climatic elements with the aid of maps, charts, and instruments. The various meteorological instruments will be studied, as well as the methods of taking and recording the observations.

### NATURE STUDY

Cornell University is admirably located for the study of nature in the field. Fish hatcheries, state and municipal parks, museums, and game farms are convenient to the campus and to those who wish to study the methods there followed in addition to becoming acquainted with the wild life in its natural setting. To assist qualified teachers with the methods of working with students successfully in the field, special trips have been arranged to various points of interest during the week-ends of the summer session. Attendance upon these trips is a privilege extended only to those whose training and experience are such as to justify the additional responsibilities upon the staff. The nature of these trips necessitates the limitation of numbers of students attending. Among the places to be visited during the summer of 1930 are a peat bog, an unimproved gorge, a lake-shore wild-life preserve, the highest hill in the vicinity of Ithaca (over 2000 feet), and a demonstration forest. Permission to attend these trips is secured through Professor PALMER.

**S 2. Nature Literature.** Credit two hours. Lectures, M W F, 12. Laboratory periods to be arranged. *Roberts 292.* Professor COMSTOCK.

Only those who have had course S 7a or its equivalent are eligible. The course includes discussions of nature study reference books, nature story writers, and nature essayists and poets.

**S 7a. General Nature Study.** Credit two hours. Lectures, M W F, 10. *Fernow 122.* Field and laboratory work, T Th, 10-12:30, or 1:40-4. *Fernow 8.* Professor PALMER, Professor COMSTOCK, Miss GORDON, and Mr. KELLOGG.

To acquaint teachers with the principles and methods of education through nature study and to give practice which will permit them to carry on the work independently. As many as possible of the laboratory periods will be spent in the fields in the study of birds, trees, herbs, and insects; students expecting to take the course should keep this in mind. The program adopted by the *Cornell Rural School Leaflet* since January, 1920, will be followed in lectures and the exercises will include practical methods for conducting nature study work in the graded and ungraded elementary schools in accordance with the program of New York State. Laboratory and field work open only to those taking the work for credit.

**S 126. The Teaching of Science in the Rural Secondary School.** Credit two hours. Daily except Sat., 9. *Fernow 16.* Professor PALMER.

A study of the science program in rural high schools; the functions of the recognized high school sciences such as general science, biology, zoology, physics, chemistry, and earth science, together with methods of teaching. Designed primarily for experienced teachers. Teachers will find it useful in connection with this course to take Biology S 2, see page 65, where problems in laboratory practice and technique will be presented.

**S 126a. The Teaching of Science in the Rural Secondary School.** Credit one hour. M W F, 11, and T Th, 11-12:50. One conference period a week. July 21 to August 1. *Fernow 8.* Professor PALMER.

Designed for teachers of agriculture and others who expect to teach courses in science, and who desire to know the science program for rural high schools and the outstanding problems in the field. The work is planned primarily for experienced teachers.

### ORNITHOLOGY

**S 11. Ornithology.** Credit three hours. Lectures, M W, 11. *McGraw 5.* Laboratory, M W, 1:40-4:30, or T Th, 1:40-4:30. Field work, M W, or T Th, 5:30-8 A. M. Professor ALLEN, Mrs. ALLEN, and Mr. CROUCH.

This course gives an introduction to the study of birds and familiarity with the local species. The lectures cover such subjects as classification, migration, coloration, song, nest-building, eggs, care of young, methods of attracting birds, and

their economic importance. The laboratory work with bird skins gives an intimate knowledge of the birds of Eastern North America and familiarity with the use of a manual. The aim of the field work is the identification of birds by their songs and habits as well as by their plumage. Each student should be provided with field or opera glasses. Laboratory fee, \$3.

**S 131. Applied Ornithology.** Credit two hours. Lectures, laboratory, and field work. M W, 1:40-4:30, and other hours by appointment. *McGraw*. Open only to those who are taking the elementary course or who have had its equivalent. Professor ALLEN.

This course is intended to meet the needs of students who plan further study of ornithology. The lectures cover the field open to prospective ornithologists, methods of study and teaching, preparation of specimens and lantern slides, bird photography, wild life conservation, and game farming. The laboratory and field work will give practical exercises. Laboratory fee, \$3.

## PHYSICAL EDUCATION

Arrangements have been made whereby men in the Summer School of Agriculture may register in Physical Education S 11, upon the payment of a \$15 tuition fee.

**S 11. High School Athletics (Men).** Daily except Sat., 2-4. *GS 134*. Mr. CHAMBERLAIN.

The high school attitude toward athletics as a part of the school curriculum; the present day tendencies in the various states; with emphasis upon methods of handling high school boys and upon training for leadership. The second hour will be devoted to practical work in the fundamentals of football and basketball, with tactics of offense and defense. The course is intended primarily not to train for professional coaching, but to supply information, material, and practice to those who may be called upon to coach in connection with their other teaching.

## POMOLOGY

**S 1a. The Growing of Apples in New York State.** Credit one or two hours. For one hour credit, lectures, daily except Sat., 11; practice, daily except Sat., 12, July 21 to August 2. For two hours credit, additional hours to be arranged. *East Roberts 108*. Professor MACDANIELS.

A course designed primarily for teachers of agriculture, county agents, and apple growers. During the first part emphasis will be placed upon the best cultural methods in the light of recent research. Then attention will be given to harvesting, grading, packing, and marketing. The daily laboratories will give opportunity for demonstration and practice in such activities as pruning and grafting, and also in packing if material is available.

## POULTRY HUSBANDRY

**S 135a. Poultry-Farm Management.** Credit one hour. Lectures, daily except Sat., 11. Laboratory, M W, 1:40-4. *Poultry 300*. August 4 to 15. Mr. MARBLE.

A special unit course for students of poultry husbandry or farm management dealing with the principles of farm management as applied to the poultry farm. All factors affecting farm profit will be studied in detail in the lecture periods. Laboratory work will include cost problems, analysis of poultry farm records, and field trips to successful poultry farms.

## RURAL EDUCATION

The Department of Rural Education offers courses designed primarily for training in the fields suggested below. The suggestions made are for the convenience of students and are not intended to represent all the desirable choices. Students interested in other fields should consult the advisers.

Fields	Psychology and Measure- ment	Educational Method	Administra- tion and Supervision	Principles of Education
<i>Agricultural Education</i>				
Teachers of Agriculture	SI11a, SI11b	SI32, SI32d, SI32e, SI32f, S232		SI81
Supervisors and Teacher-Trainers	SI11b, SI51	S226, S232	S245a, S261, S262b, S263, S267	SI81 S282
Leaders in Cooperative Extension	SI12, SI51	S226	S268	
College and Normal School Teachers	SI11b, SI51	S226, S232	S245a, S261, S262b, S263	SI81
<i>Industrial Arts Education</i>				
	SI11a, SI11b	S42, SI21b		SI81
<i>Home Economics Education</i>				
Teachers of Home Economics	SI11a, SI11b, SI16	SI34, SI35a		SI81
Supervisors and Teacher-Trainers	SI11b, SI16	S226, S235	S261, S262b, S263, S269	SI81
Leaders in Cooperative Extension	SI12	S226	S261, S268	
College and Normal School Teachers	SI11b, SI51	S226	S261, S262b S263, S268	SI81
<i>Science Education</i>				
Teachers of Nature Study	SI11a, SI11b	S7a, SI21a		SI81
Teachers of Science	SI11a, SI11b, SI50 or SI51	SI21b, S226		SI81, S282
Supervisors of Nature Study and Science	SI11a, SI11b, SI50 or SI51	SI21a, SI26, SI26a, S226	S263	SI81, S282
College and Normal School Teachers	SI11b, SI51	SI21b, SI26, SI26a, S226		SI81, S282
<i>General School Leadership Education</i>				
			SI75, S179, S261, S262b, S263	
Principals of High Schools	SI11a, SI11b, SI51	SI21b, SI26, S226		SI81 S282
Supervisors of Rural Schools	SI11a, SI11b, SI50	SI21a, SI25, S226	S261, S263	SI81, S282
Superintendents of Schools	SI11a, SI11b, SI50 or SI51	SI21a, SI25, S226	S261, S262b S263,	SI81, S282
College and Normal School Teachers	SI11b, SI51	S226	S261, S262b, S263	SI81 S282

Additional courses in Education are offered by the Summer Session of Cornell University, see page 27.

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## EDUCATIONAL PSYCHOLOGY AND MEASUREMENT

S 111a. **Psychology for Students of Education.** Credit two hours. Daily except Sat., 11. *Fernow* 122. Dr. WINSOR.

A point of view in psychology for students of education. The nature of man with emphasis on the tendencies to behavior basic to learning. The learning process. Individual differences.

S 111b. **Psychology for Students of Education.** Credit two hours. M W F, 7:30-8:50. *Roberts* 292. Assistant Professor BAYNE. Prerequisite S 111a or its equivalent. Students who have not had S 111a should confer with the instructor before registering for this course.

Following the argument of S 111a, more extended treatment will be given to selected topics in the psychology of learning, such as special aspects of the laws of learning; trial and error in learning; the conditioned response; controlled thinking.



**S 112. Psychology for Extension Workers.** Credit two hours. M W F, 7:30-8:50. *Caldwell* 250. Professor KRUSE.

A point of view in education and in psychology for extension workers. The nature of man with emphasis on the tendencies basic to the effective influencing of human behavior. How human beings come to be what they are. How they differ in quantity and quality of traits.

**S 116. Psychology for Students of Child Training.** Credit two hours. Daily except Sat., 11. *Caldwell* 100. Professor KRUSE. Prerequisite III or S111a or equivalent. Students offering an equivalent are requested to confer with instructor before registering. This course may be taken in lieu of 116 given during the regular year.

**S 150. Mental and Educational Measurement.** Credit two hours. Daily except Sat., 9. *Caldwell* 143. Dr. WINSOR.

A beginning course for students of child training and for teachers of the primary and intermediate grades. A study will be made of individual and group tests in relation to development, diagnosis, and classification of young children.

**S 151. Educational Measurement.** Credit two hours. Daily except Sat., 10. *Caldwell* 100. Assistant Professor BAYNE.

A beginning course for teachers in the upper grades of the elementary school and in the high school. Measurement in relation to the classification of pupils, the determination of the progress of pupils, individual difficulties, and the determination of final marks. Typical tests and scales and elementary statistical terms and methods will be studied in their relation to these problems.

#### EDUCATIONAL METHOD

**S 42. Organization and Methods of Teaching Industrial Arts.** Credit two hours. Daily except Sat., 8. *Rural Engineering Laboratory*. Mr. KULP.

A course required of Industrial Arts students who desire certification. Consideration is given to the point of view in industrial arts education, aims and objectives, the organization of instructional materials and the courses of study for the small high school; related subject matter commonly taught; the management of the shop, including shop equipment and shop procedures.

**S 121a. Method and Procedure in Teaching in the Elementary School.** Credit two hours. Daily except Sat., 10. *Caldwell* 143. Miss HICKS.

A consideration of the problems of teaching: how to motivate study, cultivate interest, organize teaching materials, select and solve problems, plan class procedure, construct and use questions, drill, measure the results of teaching, etc., to make clear the principles which are fundamental to efficient instruction.

**S 121b. Method and Procedure in Teaching in the Secondary School.** Credit two hours. Daily except Sat., 10. *Caldwell* 282. Professor GENTRY.

This course deals with certain principles of teaching in junior and senior high schools, and their application to such practical problems as selecting and organizing teaching materials, planning class work, making the assignment, providing for individual differences, determining classroom and laboratory procedures, directing study, managing the class, measuring the pupil's achievement.

**S 125. The Teaching of Reading.** Credit two hours. Daily except Sat., 2. *Caldwell* 143. Miss HICKS.

This course deals with the various phases of the reading process. Attention will be given to diagnosis, remedial work, types of reading, materials suitable for the various grade levels, recent investigations and recommendations. The course is designed for teachers, principals, and supervisors.

**S 126. The Teaching of Science in the Rural Secondary School.** Credit two hours. Daily except Sat., 9. *Fernow* 16. Professor PALMER.

A study of the science program in rural high schools; the functions of the recognized high school sciences such as general science, biology, zoology, physics, chemistry, and earth science, together with methods of teaching. Designed primarily for experienced teachers. Teachers will find it useful in connection with this course to take Biology S 2, see page 65, where problems in laboratory practice and technique will be presented.

**S 126a. The Teaching of Science in the Rural Secondary School.** Credit one hour. M W F, 11, T Th, 11-12:50, one conference period a week. July 21 to August 1. *Fernow* 8. Professor PALMER.

Designed for teachers of agriculture or others who are called upon to teach courses in science and who desire to know the science program in rural high schools and the outstanding problems in the field. The work is planned for experienced teachers.

**S 132. The Teaching of Vocational Agriculture in the Secondary School.** Credit two hours. Lectures, M T Th F, 9. Laboratory, W, 1:40-4. *Caldwell* 282. Mr. HOSKINS.

Designed for teachers of agricultural courses or for students preparing to teach such courses. Students not registered in S 132 d or S 132 f are required to make a minimum of three field trips.

A study of the problems confronting the teacher of agriculture; the vocational point of view in instruction; determination of courses of study from field studies and analyses; forms used in teaching, including the selection of materials and their organization for instruction purposes; the relationships of the agricultural teacher to other agencies of agricultural training in the community.

**S 132d. Laying out the Agricultural Program in the Secondary School.** Credit one hour. Daily except Sat., 8. Laboratory, T Th, 1:40-5:00. July 7 to 18. *Caldwell* 282. Mr. HOSKINS.

A special unit course designed for teachers of agriculture who desire help in organizing their programs according to local and state needs.

**S 132e. The Teaching of Agricultural Economics and Farm Management in High School Departments of Agriculture.** Credit one hour. Daily except Sat., 8. Laboratory, T Th, 1:40-5. July 21 to August 1. *Caldwell* 282. Mr. HOSKINS and Assistant Professor HARRIOTT.

A special unit course designed specifically for teachers of vocational agriculture, based upon a study of concrete cases.

**S 132f. Procedures and Techniques in Teaching Vocational Agriculture in the Secondary School.** Credit one hour. Daily except Sat., 8. Laboratory, T Th, 1:40-5. August 4 to 15. *Caldwell* 282. Mr. GETMAN.

A study of specific teaching situations as a basis of discovering and defining desirable procedures and techniques.

**S 134. Homemaking in the Intermediate Grades.** Credit two hours. Daily except Sat., 10. *Caldwell* 294. Assistant Professor WELCH.

A study of the problems involved in teaching homemaking in the intermediate grades; purposes of homemaking in the grades, the selection and organization of study and teaching problems, and methods of teaching.

**S 135a. Special Problems in Teaching Homemaking.** Credit four hours. Daily except Sat., 11-1. *Practice House*. Miss VAN LIEW.

This course deals with problems such as the school lunch, the school apartment or house, and community agencies in teaching and developing the homemaking program. Laboratory fee, \$8.

**S 226. Foundations of Method.** Credit two hours. Daily except Sat., 10. *Goldwin Smith* 183. Professor HARPER.

This course is designed primarily for experienced elementary and high school teachers and supervisors. It will include a critical examination of current and proposed educational methods in the light of accepted principles of educational psychology. Special attention will be given to the theories involved in project-teaching. The course will include such topics as the laws of learning, interest and effort, the thinking process, the organization of experience, the relationship between subject matter and the educative process, discipline and moral training.

**S 232. The Teaching of Vocational Agriculture in the Secondary School.** Credit two hours. M T Th F, 9. Laboratory, W, 1:40-4. *Caldwell* 250. Primarily for state supervisors and teacher-trainers; open to other graduate students by permission only. Professor GENTRY.

Designed to consider in a critical way the problems confronting supervisors and teacher-trainers in agricultural education. For the nature of the problems, see S 132.

**S 235. The Teaching of Homemaking in the Secondary School.** Credit two hours. Daily except Sat., 9. *Caldwell* 294. Miss BULL.

This course is particularly designed to assist teachers in improving their methods of teaching. Study will be made of recent investigations in the field of homemaking and of their bearings upon the homemaking curriculum in secondary schools, the content of courses, and teaching methods.

#### EDUCATIONAL ADMINISTRATION AND SUPERVISION

**S 17. The Curriculum of the Junior-Senior High School.** Credit two hours. Daily except Sat., 12. *Goldwin Smith* 264. Mr. MEYER.

Special emphasis will be placed upon the curriculum in its relation to the large aims of the secondary school. The complementary nature of the junior and senior high school will receive particular attention.

**S 175. The Principalship of the Centralized and Village School.** Credit two hours. Daily except Sat., 8. *Caldwell* 143. Mr. SNYDER.

This course is designed for principals and superintendents of centralized and village schools having both elementary and secondary work, and for those preparing for such positions. Among the problems considered are: the school and its relation to its community; an analysis of the principal's activities and his relation to pupils, teachers, parents; the organization of the school, schedule making, placement and time allotment of subjects, and distribution of teaching load; aims and methods of supervision and the training of teachers in service; the administration of curricula and courses of study; the administration of pupil progress; pupil guidance and study supervision, direction and control of extra-class activities, the organization of the office and office work; the principal and the community.

**S 179. The Principalship of the Village School.** Credit two hours. Daily, August 4 to 15. First meeting M, 9:30. *Fernow* 210. Dr. BROWNELL.

A unit course designed specifically for principals of smaller high schools, who are also responsible for the organization, administration, and supervision of the elementary grades. See S 175 for a statement of problems considered.

**S 245a. The Problem of Directed Teaching in the Training of Teachers of Vocational Agriculture.** Credit one hour. M W F, 11. *Caldwell* 282. Open to graduate students in agricultural education who are registered for S 232 or S 267. Professor STEWART.

A study of the organization and practice of directed teaching in relation to the college preparation of teachers of vocational agriculture.

**S 261. The Administration of Rural Schools.** Credit two hours. Daily except Sat., 10. *Caldwell* 250. Mr. SNYDER.

A consideration of problems in administration for the attainment of these objectives: (1) an understanding of significant questions that face the rural school administrator; (2) a comprehensive view of the organization of education in the state, particularly with reference to the rural situation; (3) the development of principles for the guidance of the administrator in attacking his problem. The approach will be through an analysis of specific administrative difficulties.

**S 262b. The School Population.** Credit two hours. Section 1, daily except Sat., 11, *Caldwell* 292. Section 2, for district superintendents only, daily, July 7 to 18. First meeting M, 8, *Fernow* 210. Professor BUTTERWORTH.

Typical problems: Measuring pupil progress; classification and grading; elimination and its causes; case studies of retardation; attendance; the visiting teacher and her work; pupil personnel records; adjusting the school organization to meet individual needs. The work will center about actual problems; hence prospective members of the class are urged to bring definite data from their schools. Write to the instructor in charge for an outline of the types of data that will be most useful.

**S 263. Procedures and Techniques in Supervision.** Credit two hours. Daily except Sat., 11. *Caldwell* 143. Professor HARPER.

Designed for supervisors and for experienced teachers who expect to do supervisory work. A consideration of the nature and purpose of supervision; the

improvement of the learning and teaching process; skill in observation; analysis of methods; relationships between general and specific objectives; selection, analysis, and organization of subject matter; measuring and testing results; assisting teachers in professional growth. The experience and needs of the class will determine the emphasis and nature of treatment of these various aspects.

**S 267. The Administration and Supervision of Agricultural Education.** Open to graduate students only. Credit two hours. M T Th, 2-3:30. *Caldwell* 250. Professor STEWART.

Designed primarily for persons preparing to administer and supervise agricultural education in the light of the Federal Vocational Education Act, the state organization for administering vocational education, and the problems arising within the State. Participation in field study and observation will be a part of the program.

**S 268. Organization and Administration of Cooperative Extension Work.** A study of practice in the development, organization, and management of state and county programs in cooperative extension work. Dr. LADD and others.

The course is divided into two sections that from time to time meet together for consideration of problems common to Agricultural Extension and Home Economics Extension.

**Section 1.** For workers in Agricultural Extension. Credit two hours. Daily except Sat., 10. *East Roberts* 232. Mr. HOCHBAUM and others.

A study of principles applicable to the effective and economical development, organization, and executive conduct of extension work in agriculture; the interrelations of the departmental undertakings of agricultural extension; the relations of an extension program in agriculture to the agencies of research and resident instruction in agriculture, to an extension program in Home Economics, and to other educational agencies.

**Section 2.** For workers in Home Economics Extension. Credit two hours. Daily except Sat., 10. *Home Economics* 100. Professor VAN RENSSELAER and others.

A study of principles applicable to the effective and economical development, organization, and executive conduct of extension work in Home Economics; the interrelations of departmental undertakings in an extension program for Home Economics; the relations of an extension program in Home Economics to the agencies of research and resident instruction in Home Economics, to the work in agricultural extension, and to other educational agencies.

**S 269. The Administration and Supervision of Homemaking Education.** Credit two hours. Open to graduate students only. Daily except Sat., 8. *Caldwell* 294. Assistant Professor WELCH.

This course is intended for supervisors and for teachers who are preparing for supervisory positions in homemaking. It is concerned with the analysis of the supervisor's job and with methods of supervision. Among the problems to be treated are the organization and the administration of homemaking departments; principles underlying the present-day changes in homemaking education; principles underlying the organization of courses; evaluation of teaching; improvement of teachers in service; teachers' conferences and study classes.

#### PRINCIPLES OF EDUCATION

**S 181. Principles of Education.** Credit three hours. Daily, except Sat., 11-12:30. *East Roberts* 232. Mr. PALMER.

An integrating course designed to give an orientation in modern education. Among the topics to be treated are the nature and significance of education; biological, psychological, and social foundations; educational aims and values; the curriculum; the functions and relations of the various school levels; the relation of the theory of education to practice. This course meets certification requirements in this field.

**S 282. Educational and Vocational Guidance.** Credit two hours. Daily except Sat., 8. *Caldwell 100.* Dr. BROWNELL.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

#### RURAL ENGINEERING

**S 40a. Farm Shop.** Credit two hours. T Th, 1:40-4, and S, 8-1. *Rural Engineering Laboratory.* Assistant Professor ROEHL.

A course for teachers of agriculture in farm carpentry and such correlated drawing as farmers may find helpful in construction and repair work; selection and care of farm shop tools; study of the steel square; tool grinding, saw filing, fitting handles, window repairing; painting and refinishing. Special consideration is given to preparing men to teach this work as a part of the vocational course in agriculture. Laboratory fee, \$3.

Students for whose programs the hours given above present conflicts, should see the instructor.

**S 40b. Farm Shop.** Credit two hours. M W, 1:40-4 and S, 8-1. *Rural Engineering Laboratory.* Assistant Professor ROEHL.

A course for teachers of agriculture in farm shop work including the following: harness repairing, rope work, soldering, belt lacing, cold metal working, farm blacksmithing. Special attention is given to the selection of jobs, to the best methods of doing these jobs, and to degrees of skill which should be attained in the performance of them. Students will be expected to demonstrate the performance of one such job. Consideration is given to the tool equipment necessary to meet the repairs and construction problems arising on various kinds and sizes of farms. The farm blacksmithing work is confined mainly to such forge work as will aid in the repairing of farm machinery and in the shaping and tempering of cold chisels, punches, picks, harrow teeth, etc. Laboratory fee, \$3.

**S 40c. Farm Shop.** Credit three hours for three special units of two weeks each. Units may be taken separately for one hour of credit each. T Th, 9-12 and any other three hours M W F S, 9-12. *Rural Engineering Laboratory.* Mr. WRIGHT.

Unit 1, July 7 to 19, electricity and plumbing;

Unit 2, July 21 to August 2, overhauling single cylinder gasoline engines, and automobiles;

Unit 3, August 4 to 15, overhauling farm machinery, and sewing-machine repairing.

These courses are intended to give manipulative skill and methods of learning.

**S 41. General Shop Work for Rural High School Teachers.** Credit three hours. M W, 9-12 and any other three hours T, Th, or F, 9-12. *Rural Engineering Laboratory.* Assistant Professor ROEHL and Mr. WRIGHT.

A course in training for teaching general industrial arts work in rural high schools. Practical jobs to develop skill in woodwork, drawing, soldering, electricity, plumbing, fitting tools, painting and glazing, concrete work, furniture refinishing, automobile care and repair, as suited to the needs of the youth of a community. Laboratory fee, \$3.

A course in the organization and methods of teaching industrial arts is offered in the Department of Rural Education. See S 42, page 73.

#### RURAL SOCIAL ORGANIZATION

**S 12. The Sociology of Rural Life.** Credit two hours. Lectures and reports, daily except Sat., 9. *Roberts 292.* Professor ANDERSON.

This course consists (1) of an examination of the sociological structure of rural life which furnishes the basis for (2) the analysis of rural life problems. Some of the problems considered are health, education, religion, standards of life, the family, government, social life, and recreation. These problems are considered as a phase of community organization and as such are analyzed in their sociological aspects. Students are expected to draw specific material from their own communities.

**S 16. Recreational Leadership.** Credit two hours. Daily except Sat., 9. Two additional hours in the afternoon each week are required for practice in leading games. Hours to be arranged. *East Roberts 232.* Professor FELTON.

The aim of this course is to prepare students for recreational leadership in schools, granges, churches, and other community meetings. The following subjects are considered: the educational value of play; the periods of childhood and their relation to a course of play and games; play as physical training; play for the development of social relations; play for the formation of habits and character; the place of play in the home; the home playroom and playyard; school playgrounds; community playgrounds; recreation in the program of the church; recreational programs for community halls; and play days in rural schools.

**S 21. General Sociology.** Credit two hours. Students should have junior standing. Lectures and discussions. Daily except Sat., 11. *Roberts 292.* Professor ANDERSON.

The aims of the course are two: first, to study the structure and function of society; and, second, to give an appreciation of processes and forces which may be directed to wholesome societal development. The social structure, activities, influences, controls, and changes as exemplified in both urban and rural life constitute the subject matter of this study.

**S 121. The Family.** Credit two hours. Daily except Sat., 10. *Roberts 292.* Professor SANDERSON.

This course considers the social problems of the family both on the farm and in the city; the history of the family, particularly during the past century; the differences between family life in the country and in the city; the function of the family in society; marriage and divorce; relations of parents and children; and how the family may be conserved. Fee for materials, \$1.

**S 122. Social Problems and Social Welfare Organization.** Credit one hour. M W F, 11. *Caldwell 250.* Professor SANDERSON.

A study of such social problems as poverty, delinquency, crime, the physically handicapped, the feeble-minded and mentally diseased, social insurance, health and society, mother's pensions; a consideration of public and private agencies for social work and desirable public policy with regard to the organization and support of such agencies. This course must be accompanied by either Course 123 or 124 or by both.

**S 123. Special Lectures on Social Problems.** Credit one hour. Lectures, T Th, 12. *Roberts Assembly.* Round Table Discussion, T Th, 4. *East Roberts 232.*

A series of lectures and round table discussions by non-resident lecturers in social problems affecting the public welfare, as outlined in Course S 122. The speakers will include some of the heads of state departments and institutions, members of the staff of the State Charities Aid Association, and other leaders in public welfare work.

**S 124. Field Trips to State Institutions.** Credit one hour. Saturday, all day. Professor SANDERSON.

These trips are open to those registered in course 122 or 123, and to others for individual trips by special arrangement, and are designed to give students an opportunity to observe how the State is caring for its maladjusted citizens. Visits will be made by automobile to the State School for Boys at Industry, to Willard or Binghamton State Hospital, to the Home State School for the Feeble-minded, to the Elmira Reformatory, to the County home, and to the George Junior Republic. Fee, \$12.

**S 211. The Rural Community.** Credit one or two hours. For graduate students. Prerequisite permission of instructor to register.

Personal conferences and individual work, at hours to be arranged. Professor SANDERSON.

A comparative study of types of rural communities and their historical development and a sociological analysis of the modern rural community.

## VEGETABLE GARDENING

The courses have been planned to meet the needs of advanced and graduate students from this and other institutions as well as for secondary teachers. A program may be chosen entirely in this field, but preferably in combination with other subjects. Schedules have been arranged to avoid conflict with certain courses in other departments that have proved of interest to vegetable gardening students. Resident study during the summer and including the Summer School may be counted toward an advanced degree if proper arrangements are made. Two years' attendance at Summer School permits taking both course S 12 and S 112, which are given in alternate years.

**S 1. Vegetable Gardening.** Credit two hours. Lectures, T Th S, 9. *Poultry 174.* Laboratory, W, 1:40-4:30, Sat., 10-12:30. *Vegetable Greenhouses and Gardens.* Professor WORK.

An introductory course dealing with vegetable plants and the principles of their production, including management, seed and varieties, plant growing, cultural requirements, enemies, grading and handling, and returns. The laboratory work will afford opportunity for first-hand acquaintance with the plants and practices. The course is broadly planned rather than narrowly specialized and will serve those who wish a brief introduction to vegetable gardening, whether teachers, college students, or others. There will be one all-day Saturday trip to a vegetable producing section at a cost of \$3 to \$5. Laboratory fee, \$2.

[S 12. **Grading and Handling Vegetable Crops.** Credit two hours. Given in alternate years. Not given in 1930. Laboratory fee, \$2. Professor WORK.]

**S 101. Advanced Vegetable Gardening.** Credit two hours. Prerequisite Course S 1 or equivalent elsewhere. Lectures, daily except Sat., 10. *Poultry 174.* One conference weekly by appointment. Professor THOMPSON.

A systematic study of results of experiments and research in vegetable production and handling and their application to the solution of practical problems.

This course is planned for advanced undergraduate and graduate students interested in any phase of vegetable work.

**S 112. Systematic Vegetable Crops.** Credit two hours. Offered in alternate years. Lectures, M W F, 11. *Poultry 174.* Laboratory, T Th, 1:40-4:00. *Vegetable Gardens*, East Ithaca. Professor WORK.

Origin, history, taxonomy, types, and varieties; improvement problems; description, classification, nomenclature; exhibition and judging. Leading varieties of the vegetable crops are grown in the gardens supplying material for field study of the plants and types. Laboratory fee, \$2.

This course is planned for any who are interested in the subject whether specializing in vegetable gardening or not. It is desirable, though not mandatory, that an elementary course precede course S 112.

**S 221. Special Problems in Vegetable Gardening.** Credit two or more hours. Hours to be arranged. Open to graduate students and advanced undergraduates with adequate preparation. *Poultry 174.* Professors THOMPSON and WORK.

A study of some specific topic of the growth of vegetable crops, or of the handling of vegetable products. This may involve a critical review of the literature of some special subject, or the investigation of some special phase of the research projects under way in the greenhouse or gardens. Students may, by special arrangement, continue the work throughout the summer.

**S 222. Seminary.** Time to be arranged. Reviews of literature, reports of research in progress, discussions.

## SPECIAL UNIT COURSES IN THE SUMMER SCHOOL OF AGRICULTURE

Teachers of agriculture, county agents, and other rural leaders find it difficult frequently to be away from their respective duties for six weeks. Owing to the large number of requests for courses of less than six weeks' duration a group of courses is offered for the convenience of these workers. See the respective departments for schedule and description of courses.

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# SUMMER SCHOOL OF HOME ECONOMICS

## IN THE

### NEW YORK STATE COLLEGE OF HOME ECONOMICS

#### STAFF OF INSTRUCTION

MURIEL BRASIE, M.A.	Clothing and Textiles
(Assistant Professor of Home Economics)	
LUCILE S. BREWER, B. S.	Food Preparation
(Extension Professor of Home Economics)	
MILDRED CARNEY, B.S., M.A.	Textiles and Clothing
(Extension Assistant Professor of Home Economics)	
MARIE FOWLER, B.S., M.A.	Child Guidance
(Professor of Home Economics)	
GRACE GARDNER, B.S.	Child Guidance
(Instructor in Home Economics)	
MARY FRANCES HENRY, M.A.	Human Nutrition
(Professor of Home Economics)	
HELEN MONSCH, M.A.	Human Nutrition
(Professor of Home Economics)	
GRACE MORIN, M.A.	Household Art
(Assistant Professor of Home Economics)	
JEAN PATTISON, M.D.	Child Guidance
(Pediatrician)	
KATHERINE REEVES, B.A.	Child Guidance
(Instructor in Home Economics)	
RACHAEL SANDERS, M.S.	Human Nutrition
(Instructor in Home Economics)	
ALMA FINCHER SCIDMORE.	Household Art
(Extension Instructor in Home Economics)	
MARION VAN LIEW, B.S.	Special Problems
(Chief, Home Economics Bureau, State Department of Education, Albany)	
MARTHA VAN RENSSELAER, A.B.	Extension Education
(Director of the College of Home Economics)	
ETHEL B. WARING, Ph.D.	Child Guidance
(Professor of Home Economics)	
MARGUERITE WILKER, Ph.D.	Child Guidance
(Extension Professor of Home Economics)	

#### COURSES OF INSTRUCTION

The courses offered in the Summer School of Home Economics are designed to meet the needs of both graduate and undergraduate students for teaching, extension, and general vocations requiring home economics training. A special announcement, which may be had on request, gives a suggested sequence of courses for a major or a minor in one or two related departments in the College of Home Economics and for a major or minor in the College of Home Economics and a major or a minor in Home Economics Education.

#### FAMILY LIFE

The courses in Child Guidance form a part of a family life program. They are aimed to promote efficient, harmonious, and wholesome

home life, by giving parents, pre-parents, and teachers an understanding of child nature, its needs and its guidance. Since it is impossible to gain adequate practical information about children unless opportunity is offered for observing children, a Nursery School having sixteen children between the ages of two-and-a-half and four-and-a-half years is maintained as a laboratory for courses in child guidance. The children are under the direction of psychologists and experienced nursery-school teachers. In order to maintain the highest standards of health and to prevent contagion a trained nurse, present through the morning hours, makes a daily health examination of each child and of each student or other adult who enters the Nursery School. A pediatrician makes a thorough physical examination of each new child who enters. A dietitian directs the feeding. Meetings of the parents of the children are held once or twice during the summer school. All these activities come under the observation of students registered for courses in Child Guidance. To protect the children it is possible to have only a few observers present with them at any one time. This necessarily limits the number of students who may register for courses in Child Guidance in the summer school, and therefore application for admission to these courses must be made and acted upon in advance of the student's arrival in Ithaca. Successful applicants for all but the orientation course must have had psychology.

Students whose applications for courses in Child Guidance have been accepted should report on the day of registration to the instructor in charge for laboratory assignment before completing a program of work.

Students registered for courses in Child Guidance are expected to be present at parents' meetings, which will be announced.

**S 100. General Orientation Course in Child Guidance.** Credit two hours. Lecture-discussions, daily except Sat., 3. *Home Economics* 100. Laboratory, daily except Sat., one hour by arrangement. Laboratory fee, \$7.50. *Nursery School*. Professor FOWLER, Miss REEVES, Miss GARDNER.

This course is planned to meet the needs of those general teachers of Home Economics who are required to teach child care and training in the high schools and who are not eligible for the regular elementary course. This is a general course without child-psychology prerequisites. The object is to promote through observation and discussion some understanding of child needs and of child-child and child-adult relationships.

**S 205. Principles in Child Guidance (Advanced Course).** Credit three hours. Prerequisite S 101. Recommended for teachers and extension workers. Lecture-discussions, daily except Sat., 8. *Home Economics* 100. Laboratory, daily except Sat., one hour by arrangement. *Nursery School*. Laboratory fee, \$7.50. Professor WARING, Miss REEVES, Miss GARDNER.

It is the purpose of this course to discover from observation what any specific behavior of a child may involve in performance, in attitude, and in meaning. It is intended to accumulate enough records of his behavior to indicate what elements in a situation influence his behavior most; how he usually responds to them; how adults may change the situations and thereby modify his behavior; how personality is thus developed day by day; a process for which adults are responsible.

**S 104. Parent Groups in Extension.** Credit two hours. For extension teachers, county agents, and other interested persons. Lecture-discussions, daily except Sat., 8. *Home Economics* 245. Extension Professor WILKER.

A point of view in parental education and child guidance for those especially concerned in arousing the active interest of parental groups in continued study. Committee, publicity, and other types of organization work. Lecture-discussion plan, study-club plan, and lay-leader plan.

**S 109. Parent-Child Guidance for Extension Teachers.** Credit two hours. Prerequisite Child Guidance 101 and 107 or the equivalents. Lecture-discussions, daily except Sat., 9. *Home Economics* 100. Extension Professor WILKER.

Study of extension programs in parent-child guidance. Examination of the subject matter suitable for extension groups and adequate methods for its presentation.

**S 125. Home Nursing and Child Hygiene.** Credit two hours. Lecture-discussions, daily except Sat., 3. *Home Economics* 245. Dr. PATTISON.

This course is planned to meet the needs of teachers required to teach child care and home nursing in the high schools. It helps the student to observe and appreciate evidences of good health and the conditions under which good health is promoted, and gives practical knowledge about the prevention of diseases and about nursing techniques in the home.

#### FOODS AND NUTRITION

**S 35. Elementary Dietetics.** Credit two hours. Prerequisite courses in foods and chemistry satisfactory to the instructor. Lectures, M W F, 2. *Home Economics* 310. Discussion and laboratory, T Th, 1:40-4. *Home Economics* 205. Time subject to change. Laboratory fee, \$2. Professor HENRY.

**S 131. Nutrition of Children.** Credit two or three hours. Prerequisite a previous course in general nutrition and dietetics. Lectures and discussions, daily except Sat., 2. *Home Economics* 100.

Practice twice a week in infant feeding, pre-school feeding, or school feeding. Limited to 20 students. Infant feeding laboratory, T Th, 3-5; pre-school laboratory, T Th, 11-1; school laboratory, W, 11-1. Professor MONSCH and Miss SANDERS.

Principles underlying the selection, preparation, and serving of the right foods for children from infancy through adolescence, with special emphasis on the formation of eating habits and attitudes which make for the child's physical, mental, emotional, and social well-being. Laboratories will be conducted in homes in Ithaca and in the Nursery School. Laboratory fee, \$7.50.

**S 134. Special Problems in Teaching Homemaking.** Credit four hours. Daily except Sat., 11-1, *Practice House*. Laboratory fee, \$8. Miss VAN LIEW.

This course is designed to consider problems such as the school lunch, the school apartment or house, and community agencies in teaching and developing the homemaking program.

**S 140. Food Preparation and Preservation.** Credit two or three hours. Prerequisite at least one college course in food preparation. Especially for those interested in home economics extension work and for specialists in food preparation. Lectures, discussions, and demonstrations, M T Th, 9-11:30; laboratory practice, M T Th, 1:40-4. *Home Economics* 270. Laboratory limited to 20. Laboratory fee, \$10. Extension Professor BREWER.

#### TEXTILES AND CLOTHING

**S 213. Problems in Costume Design.** Credit two hours. Open to graduate students and advanced students who have adequate preparation. Registration limited to fourteen students. Lectures, T Th, 11. Laboratory, M W F, 8-10:30. *Home Economics* 300. Laboratory fee, \$5. Assistant Professor BRASIE.

This course will include a study of the relations of art, psychology, personality, and fashion to the selection of a satisfactory wardrobe. A survey will be made of available literature in this field. The laboratory work will consist in applying the fundamental ideas of psychology and art to costume effects. Students provide all materials subject to the approval of the instructor in charge. Estimated cost of materials, \$10.

**S 217. Survey of Clothing Problems as Related to High School Teaching.** Credit two hours. Open to graduates and advanced students who have adequate preparation. Lectures, T Th, 10. Laboratory, M W F, 11-1. *Home Economics* 300. Laboratory fee, \$5. Assistant Professor BRASIE.

This course will include a consideration of the problems involved in organizing laboratory work in clothing, in selecting the problems to be presented, and in working out illustrative materials to use in an efficient presentation. A comparative study of different methods to be used for different types of problems will also be made. Students provide all materials subject to the approval of the instructor in charge. Estimated cost of materials, \$10.

**S 220. Survey of the Clothing Problem as Related to Extension Teaching.** Credit two or four hours. Open to graduates and advanced students who have adequate preparation. Registration limited to twenty students. For two hours' credit, laboratory, daily except Sat., 11-1. Four hours' credit by appointment. *Home Economics* 300. Laboratory fee, \$5. Extension Assistant Professor CARNEY.

This course will include a consideration of the problems involved in organizing extension programs in clothing, in selecting the problems to be presented in extension work, and in working out illustrative materials to use in efficient presentation. Students provide all materials subject to the approval of the instructor in charge. Estimated cost of materials, \$10.

#### HOUSEHOLD ART

**S 102. Art Essentials in Homemaking.** Credit two hours. Lectures, daily except Sat., 10-12. *Home Economics* 415. Assistant Professor MORIN.

The practical application of the principles of art to home and community problems. Lectures and discussions on architecture, furniture, textiles, and crafts; trips to homes, schools, and other buildings of interest; student problems in selection and arrangement of furniture, draperies, upholstery materials, including those suitable for school or community rooms.

**S 203. Home Furnishing Problems for Home Demonstration Agents and County Project Leaders.** Credit two hours. Offered primarily for graduate students. Prerequisite or parallel course, Art Essentials in Home Making, or a satisfactory equivalent. Lectures, daily except Sat., 12. Laboratory, daily except Sat., 2-4. *Home Economics* 415. Assistant Professor MORIN, Mrs. SCIDMORE.

This course includes the application of art principles to specific extension problems. Guidance is given in the selection and preparation of illustrative material. First three weeks: a consideration of art principles as illustrated by a study of lighting in the home. Last three weeks: the application of art principles in the consideration of floors and floor coverings.

#### HOUSEHOLD MANAGEMENT

**S 126. House Practice.** Laboratory Course. Credit three hours. Professor HENRY.

This course consists of the use of the practice house as a means of teaching household management. Registration limited to eighteen. Applicants must verify acceptance before July 1. Residence in the practice house is required for six weeks. Cost of room and board for six weeks, \$72.

#### EXTENSION COURSES

**S 268. Organization and Administration of Cooperative Extension Work.** See Rural Education, S 268, p. 76.

#### COURSES IN EDUCATION

Attention is called to courses in Rural Education, including courses in Home Economics Education, and Psychology for students of Child Guidance, on page 74; also to additional courses in Education, page 27.

# SUMMER COURSES IN HOTEL ADMINISTRATION

## STAFF OF INSTRUCTION

JESSIE AUSTIN BOYS, M.S.	Foods
(Assistant Professor of Home Economics)	
JOHN COURTNEY, B.S.	Hotel Accounting
(Instructor in Hotel Accounting)	
KATHARINE WYCKOFF HARRIS, B.S.	Foods
(Assistant Professor of Home Economics)	
HOWARD BAGNALL MEEK, M.A.	Hotel Administration
(In charge of Hotel Courses)	
ADFRED L. OLSEN, B.S.	Hotel Accounting
(Instructor in Hotel Accounting)	
ALLAN HOSIE TREMAN, A.B., LL.B.	Hotel Law
(Lecturer in Institution Management)	
RICHARD STEPHEN UHRBROCK, Ph.D.	Personnel Administration
(Assistant Professor of Rural Education)	

In 1922 Cornell University established, with the cooperation and financial assistance of the American Hotel Association, a four-year course in Hotel Administration for high school graduates expecting to go into administrative work in the hotel business. Many hotel proprietors and managers, who have been unable to take a four-year university course, have asked for shorter courses with less formal entrance requirements.

The regular summer session of six weeks is divided into two parts, or half-sessions, each running for three weeks. The first half-session is devoted to elementary work, the second to more advanced studies. The student is advised, if possible, to take the preliminary and advanced work consecutively in one summer. Instruction is offered in four subjects, food preparation, accounting, personnel administration, and hotel law.

## REQUIREMENTS

Any one employed in hotel work may apply for admission up to June 15. Prospective students will be required to present evidence of good character, of sincerity of purpose, and of interest in hotel work. As the task of checking references takes time, it is distinctly to the advantage of prospective students to file applications early, in any event not later than June 15.

Just as practical experience is made an important part of the regular four-year program, students will in general not be admitted who are not already actively engaged in hotel work.

## EXPENSES

The tuition for each unit course of three weeks is \$30.00. There is a fee of \$1.50 for the use of Willard Straight Hall. There is a laboratory fee in some of the courses to pay for supplies used.

Rooms in the Residential Halls for men are from four to six dollars a week.

Board may be obtained for an average of seven to fifteen dollars a week.

For further information and for application blanks apply at once to the Secretary, Mr. Olin W. Smith, or to Professor Richard S. Uhrbrock, Ithaca, New York.

## DESCRIPTION OF COURSES

### FOODS

#### **S 21. Elementary Food Preparation.** July 7 to July 26.

A course planned to provide the underlying principles of the culinary art. Students prepare typical dishes and entire menus on a single portion basis. Attention is also given to standards in preparation and in service. Should be taken in preparation for S 22. Assistant Professor Boys.

**S 22. Advanced Food Preparation.** July 28 to August 16. Should be taken only by those who have already taken S 21 or who have equivalent training. Laboratory work consists of actual large quantity cooking in a cafeteria kitchen, preparation on a commercial basis of the meals for several hundred patrons. The laboratories are supplemented by explanation periods to provide an opportunity to review principles and procedure and by a discussion of the problems of marketing and buying. Assistant Professor HARRIS.

### HOTEL ACCOUNTING

**S 31. Elementary Accounting for Hotel Students.** July 7 to July 26.\* The fundamental principles of accounting. The balance sheet, the profit and loss statement, the books necessary to maintain a system of accounting. Specialized hotel journals. The partnership; the corporation; controlling accounts; purchasing and stock control. Mr. COURTNEY and Mr. OLSEN.

**S 32. Hotel Accounting.** July 28 to August 16. Control of hotel income. Special methods of controlling room and food income. Relation of accounting procedure to front office practice. The transcript, the controller's report, the summary entries at the end of the month, the adjusting and closing entries, and the final closing of the books. Preparation of profit and loss statements and balance sheets with supporting schedules. The Uniform System of Accounting for Hotels as recommended by the Hotel Association of New York City. Classification of expenses. Receiving and purchase records. The purchase journal. The pay roll. Petty cash disbursements. The asset accounts. Mr. COURTNEY.

### PERSONNEL ADMINISTRATION

**S 52. Personnel Administration.** July 28 to August 16. Discussion of techniques developed for securing, hiring, and training employees. Use of rating scales, tests, charts. Assistant Professor UHRBROCK.

### HOTEL LAW

**S 62. Elementary Hotel Law.** July 28 to August 16. An elementary course intended to give a general understanding of the main principles of contracts, sales, negotiable instruments, real estate, insurance, and other practical problems, with particular reference to hotels. Planned for managers, assistant managers, clerks, and department heads. Mr. TREMAN.

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\*If a sufficient demand exists, the elementary courses will be repeated in the second half-session.

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